HISTORY OF FISHERIES MANAGEMENT IN MONTANA (1900 - 1975)

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FOREWORD

The following history of fisheries activities in Montana has been assembled from many sources. While most of the information was obtained from the biennial reports of the Montana Department of Fish and Game, other sources included log books of individual state fish hatcheries and records generously provided by the managers of the Federal fish hatcheries at Creston, Ennis and the Fish Cultural Development Center at Bozeman. Mr. Harvey Willoughby, former Chief of Fish Hatcheries, U.S. Fish and Wildlife Service, furnished copies of early-day reports from the Bozeman station filed in Washington, D.C. Personal conversations with state residents have revealed many points of interest. The assistance of individuals and free use of records is appreciated.

Special thanks are given Dr. C.J.D. Brown for his work in editing this material and for his interest and many suggestions that helped make completion of the project possible.

An attempt was made to report the highlights of fisheries management in Montana in a general chronological order. Important information has no doubt been overlooked and some details of minor importance have been excluded in the interest of brevity. Readers are encouraged to report any errors or omissions to the Department of Fish and Game so that corrections can be made in future reports.

INTRODUCTION

Almost everyone has some interest in fish or fishing and apparently the early-day residents and sojourners of the Montana Territory; such as the traders, trappers, troopers and railroaders, were no exception. Early introductions and transplants of fish were largely due to their efforts. Montana was a land abounding in beautiful lakes and streams, some of which were without fish of any kind and many certainly, without the species familiar to the settlers. And there were individuals willing to remedy the situation. An officer or civilian who really enjoyed fishing, living at or near one of the forts in the Territory, would have been sadly lacking in imagination and enterprise if he didn't somehow manage to find room in a supply wagon for a barrel of water containing a few fry or fingerlings of his favorite fish which would eventually be introduced into a stream or lake near the fort. Later, as the railroads made their way across the Territory, a much more efficient method of transporting fish was provided. The railroads ran adjacent to or bridged many of the major lakes and streams, making stocking an easy matter. Suppose, for example, a railroad executive had a summer home on a lake in the Flathead drainage. He would have had no difficulty in shipping a few "pumpkinseeds" from say, Minnesota, to put in the lake for the kids to catch. Actually, the transport of fish by rail later became the principal method of fish distribution. Special railroad cars were developed with aeration systems which made possible the transportation of fairly large numbers of fish over long distances.

Among the early settlers of the Territory there were undoubtedly a few individuals familiar with fish culture. They would have found it a relatively simple matter to set up a trough or two near a good water source and collect, fertilize and hatch eggs taken from a spawning run of native fish. The resulting fry would then be planted into previously barren waters, or perhaps waters with-

out that particular species.

One can only speculate about the early distribution of fish in Montana since no formal records were kept. Fish were shipped to Montana from Federal fish hatcheries in the East to designated stations in the state, where they would be unloaded. Their final destination, whatever the species, was left up to the persons who picked up the fish.

1902-04

The first biennial report of the Montana Department of Fish and Game covered the years 1902-04. It recounted also, some of the previous Territorial actions which pertained to fish and game.

The first Montana Territorial Legislature (1864-65) was credited with the passage of a bill providing that "a rod or pole, line and hook, shall be the only lawful way trout can be caught in any of the streams of the Territory". The same bill prohibited the baiting of hooks with any drug or poisonous substance and made the use of seines or nets illegal. The law became effective February 2, 1865. More general and complete fish and game laws were passed by the legislative session of 1871-72. These formed the basis for many of our present regulations. In 1876 a law was passed making it illegal to use explosives to kill fish. The Territorial legislature of 1879 appropriated $1,000 for the purpose of removing a part of the "Great Falls" on the Clark Fork of the Columbia River, since the falls prevented migrating salmon from reaching the upper waters of the Territory. The concern of sportsmen and conservationists over indiscriminate dumping of sawdust and mill wastes into the streams of the Territory, to the detriment of fish life, resulted in the passage of a law in 1881 making all such dumping illegal.

The enforcement of fish and game laws at that time in Montana history was probably quite ineffective since travel was slow, the Territory was large and people were few and far between. One would be inclined to believe that fisheries violations would have had to be really serious to warrant action by the U.S. Marshal. When Montana became the 41st state of the Union in September of 1889, County Commissioners were empowered by state law to hire one game warden for each county, if needed. Apparently there was little concern at the county level since no wardens were appointed.

The same year that Montana became a state the U.S. Bureau of Fisheries began

stocking fish in the waters of Yellowstone National Park. Many of these waters were tributary to Montana streams or, in some cases, flowed directly into the state. The dates, locations and species planted were as follows:

DATE	WATERS	SPECIES	NUMBER
September 22, 1889	Gardiner River	Brook trout	4,975
September 15, 1890	Gardiner River	Brook trout	7,875
September 22, 1889	Gibbon River	Rainbow trout	990
September 22, 1889	Firehole River	Loch Leven trout	995
September 2, 1890	Lewis Lake	Loch Leven trout	3,350
September 2, 1890	Shoshone Lake	Loch Leven trout	3,350
September 22, 1889	Gardiner River	Mountain trout	968
August 9, 1890	Shoshone Lake	Lake trout	18,000
August 23, 1890	Lewis Lake	Lake trout	7,262
August 23, 1890	Shoshone Lake	Lake trout	7,263
September 2, 1890	Lewis Lake	Lake trout	4,750
September 2, 1890	Shoshone Lake	Lake trout	4,750
September 15, 1890	Nez Perce Creek	Von Behr trout	9,300
October 3, 1890	Twin Lakes	Native whitefish	2,000
October 15, 1889	Yellowstone River	Native whitefish	980
August 15, 1890	Yellowstone River	Native whitefish	5,000
September 11, 1890	Yellowstone River	Native whitefish	5,000

Except for the Yellowstone and Gibbon Rivers, no fish had been previously reported from any of these streams and lakes.

The first official and professional fisheries investigation in Montana began July 18, 1891, when Dr. B.W. Evermann initiated a study of Montana and Wyoming waters. The study was concerned primarily with discovering sites suitable for fish hatcheries and several locations were recommended - Horsethief Springs at the northwest corner of Yellowstone National Park, Botteler Springs just north of Yellowstone National Park and opposite Emigrant Peak, Davies Springs on Bridger Creek near Bozeman, Cottonwood Creek at Deer Lodge, Child's Bedrock Drain some six miles east of Helena and Rattlesnake Creek near Missoula. Dr. Evermann's party took samples of fish along their route with a seine. They reported grayling, whitefish, blobs, dace and suckers from the Madison River. Fish sampled with an electric shocker in the Madison River in April of 1967 showed the following species:

NUMEROUS	COMMON	FEW	RARE
Mountain whitefish	Longnose dace	Arctic grayling	Stonecat
Mountain sucker	Mottled sculpin	White sucker	
Longnose sucker		Brook trout	
Brown trout		Cutthroat trout	
Rainbow trout			

It is interesting to note that the 1967 sample showed only four species of trout and the stonecat as additions to Dr. Evermann's list. Only the brown trout and the rainbow trout are recorded as being numerous. Though not taken in the latter Madison River samples, it is expected that carp, perch and flathead chubs are also present. The introduction of incompatible species has probably been the greatest factor in the decline of grayling numbers. That grayling were once very numerous is substantiated by old residents of the Ennis area who report that this species could, at one time, be taken by the wagonload.

Mr. Al Lucke of Havre, Montana, has investigated extensively the early history of the Bear Paw Mountains and surrounding area. According to him, the old Fort Assinniboine records show that none of the streams of the Bear Paw Mountains, the Little Rocky Mountains, the Sweetgrass Hills or those north of Glasgow which drained into the Milk River, contained trout before they were stocked. Eagle Creek, which flows from the Bear Paw Mountains into the Missouri River above the mouth of the Judith River, had a population of cutthroat trout. Soldiers from Fort Assinniboine stocked Beaver Creek, a tributary of Milk River, south of Havre, with fish from Eagle Creek sometime around 1880. Beaver Creek also received plants of cutthroat trout from the Sun River at Fort Shaw. Good catches of trout were reported from Beaver Creek in 1890. Since this creek was located almost wholly on the original Fort Assinniboine Military Reserve, fishing was limited mostly to military personnel. Civilians were required to have a special permit.

Requests received by the U.S. Bureau of Fisheries for fish to stock Montana waters were many. In response to proposals that a U.S. Fish Hatchery be located

in the state, the Bureau in 1893, sent Mr. Juan J. Jiminez from Washington, D.C., to Bozeman to investigate the feasibility of a fish hatchery on Davies Springs on Bridger Creek, one of the sites recommended earlier by Dr. Evermann. After considerable correspondence between Mr. Jiminez and Mr. C. Von Behr of the Office of Architecture and Civil Engineering in Washington, details were agreed upon and an appropriation to build the hatchery was obtained. Contracts were awarded and the station, consisting of 11 concrete ponds, 3 dirt ponds and 70 troughs, was completed in 1896. Fish production at the hatchery began in 1897 under the direction of Dr. James A. Henshall, Superintendent of the new facility.

PICTURE OF THE U.S. FISH HATCHERY - BOZEMAN

P.26 - 1905-06 BIENNIAL

PICTURE OF SUPERINTENDENT"S RESIDENCE - BOZEMAN

P.164 - 1905-06 BIENNIAL

An auxillary unit of the Bozeman station was established in March of 1898 on Henry's Lake in Idaho. The unit consisted of a small log building located on a spring (temperature 42-50 degrees F.) on the Staley Ranch. The spring supplied water to 6 eight-foot troughs. An identical auxillary station was con-

structed in April of the same year on Elk Creek (water temperature 46-55 degrees F.), a tributary of Upper Red Rock River. Mr. James Blair supervised operations at the Elk Creek station and is credited by early-day residents of the Centennial Valley with the wide distribution of rainbow trout in that general area.

The first State Board of Fish and Game Commissioners in Montana was established by Governor Robert A. Smith on March 4, 1895. Mr. R.A. Wagner was appointed State Warden in July, 1898. Chairman of the first Commission was Morton J. Elrod of Montana University at Missoula. Chairman Elrod, in September, 1900, sent a questionnaire relative to a number of fish and game matters to all newspapers in the state. The question receiving the most interest, and almost unanimous approval, was, "Are you in favor of establishing a state fish hatchery?". If sportsmen expected immediate action they were due for disappointment because it was eight years before a state hatchery became a reality.

The period around 1900 was an era of real public awareness and interest in fish and game protection, as reflected by the recommendations submitted by the Board of Fish and Game Commissioners. Some of the more important actions included establishment of a fishway at Thompson Falls, registration of all fish ponds with the Board, jurisdiction of all seining in Montana streams by the Board, requiring fish screens in all ditches before water wheels in mills and power houses, prohibition of washing coal or placing coal slack or dust in streams, passage of a law making it illegal to take any fish under 6 inches in length, requesting that all Indians be required to have a permit to hunt and fish, a request for a higher license rate to be paid by non-residents and establishment of a state fish hatchery. The Board approved passage of the Lacey Act which dealt nationally with the import and export of game. The Lacey Act passed Congress on April 18, 1900.

The Board of Fish and Game Commissioners recognized that the counties had failed to protect game and fish and that such protection should no longer be entrusted to them. Only four of the 24 counties had hired game wardens.

The Montana Fish and Game Department was officially organized, as such, on April 1, 1901. W. F. Scott was named the first State Game Warden to head the Department. The legislative bill which established the Department provided for the division of the state into game and fish districts and the appointment of not less than five or more then eight deputies - one to each district. The salary of the deputies was set at $100 per month. Upon announcing these positions, the Department received over 1,000 applications and several thousand letters of endorsement for the eight positions. The warden deputies appointed were J. H. Boucher, Altyn, Teton County; Taylor B. Greene, Malta; A. E. Higgins, Missoula; Samuel Scott, Deer Lodge; John H. Hall, Great Falls; Henry Avare, Butte; Henry Ferguson, Bozeman; Thomas T. Thompson, Miles City (replaced September 18, 1901, by Charles L. Smith). Since the salary of $100 per month included travel and living expenses, the positions were no bargain. One of the deputies reported that in his first month on the job he spent all but $9.40 of his monthly wage on travel. One of the first assignments of the deputies was to go throughout their districts and tack up posters giving a synopsis of state game laws.

No license was needed for fishing, resident or non-resident. Non-resident hunters however, were, for the first time, required to have a license. According to the report of the State Game Warden, fishing success throughout the state was generally good. The U.S. Fish Hatchery at Bozeman was credited with doing much toward keeping Montana streams stocked with fish, but the numbers of fish requested was considerably greater then the hatchery output. Clearly, there was a need for a state fish hatchery to meet the requests. It was estimated that the cost of a state fish hatchery would be approximately $5,000.

It was reported in 1901, that the yellow perch planted in Lake Sewell in 1898-99 were thriving and multiplying. Lake Sewell is included in that part of the Missouri River now covered by Canyon Ferry Reservoir. The U.S. Commissioner of Fish and Fisheries, George H. Bowers, assured the Department that a liberal

allowance of 3 to 5-inch bass would be provided for stocking Lake Sewell the following year.

The Bozeman Fish Hatchery furnished 3,000 trout fry to the Department in 1901 for stocking the North Fork of the Sun River. These fish were packed in about 40 miles by the Augusta Chapter of the League of American Sportsmen to an area above the falls where trout were not known to previously exist.

The loss of fish to irrigation systems was a constant concern of state fishermen. An early state law required the screening of all ditches, but the law was repealed by the 1897 legislature which, in that same year, passed a law requiring fishways over all dams. The latter law was largely ignored until 1901, when the Department decided to enforce it. The Buck Fishway, a design adopted earlier by Minnesota, was to be used. There are no records of any of these fishways ever being installed.

Stream pollution from coal washings was reported to be extremely bad on the Upper Yellowstone River and on Rocky Creek below the community of Red Lodge. Cyanide waste from gold mining activities was a common pollutant in a number of areas. The Department recommended to the legislature that the dumping of such wastes be made illegal and that settling ponds be required to alleviate the situation.

A new set of fish and game laws which included a number of changes, SB 29, was approved on March 4, 1902. One of the new regulations provided that seines could be used anywhere in the Missouri River, with the exception of Lake Sewell. Because of a clerical error however, the seining regulation was declared unconstitutional.

State Game Warden Scott stated that without the U.S. Fish Hatchery at Bozeman, streams of the state would be practically depleted of fish. Mr. Scott re-

ported that the State of Minnesota now had two fish hatcheries, Wisconsin had three and Washington State had fifteen. Fish planted by the Bozeman station in Montana waters in 1903 and 1904 were:

SPECIES	1903	1904
Brook trout	95,000	100,000
Rocky Mountain trout	400,000	600,000
Steelhead trout	50,000	25,000
Mackinaw trout	2,000	6,000
Rainbow trout	40,000	20,000
Grayling	1,500,000	2,500,000
Lake Superior whitefish	800,000	--

Mr. Bowers, the U.S. Commissioner of Fish and Fisheries, provided the Department with 500 adult largemouth bass for Lake Sewell in the summer of 1904.

As agriculture developed in Montana, so did irrigation systems. The heavy losses of fish to the irrigation ditches prompted Dr. Henshall, Superintendent of the U.S. Fish Hatchery at Bozeman, to devise in 1903, a paddlewheel type of barrier which, when installed in canal intakes, would keep fish from entering. Plans and details of the device were widely distributed and publicized. The Fish and Game Department threatened to discontinue the stocking of fish in any streams having irrigation ditches or canals without the paddlewheel fish excluders. In spite of the threat, very few of the excluders were ever installed. Dr. Henshall, in a letter to the editor of Forest and Stream in 1904 wrote, "It is both disheartening and discouraging to the western fish culturist to know that millions of fish, both large and small, annually perish through being stranded on the meadows and grain fields as a result of unscreened ditches. He sees a large percentage of the work of the U.S. and the State Fish Commission go for naught from this cause."

The U.S. Commissioner of Fish and Fisheries, Mr. Bowers, reported that many states were extremely indifferent to the preservation of freshwater and anadromous fishes and lacked appreciation for the work carried on by the government

through the U.S. Bureau of Fisheries. He proposed to discontinue all government fisheries work in states that exhibited no healthy sentiment in favor of their supply of food and game fishes.

1905-06

Echo Lake in Flathead County was producing excellent black bass fishing in 1905. According to angler reports, specimens up to seven pounds were taken. From Lake Sewell near Helena, bass up to 1.5 pounds were reported. Dr. Henshall of the Bozeman station observed that the waters of eastern Montana were too cold and not well suited for bass. His observation was quite accurate, but since his time, many thousands of largemouth bass have been stocked in eastern Montana ponds, largely because of their availability. Some of the initial plants were successful, but water temperatures were generally not conducive to good growth or reproduction.

Dr. Henshall published a list of the fishes of Montana in 1905. He recorded 36 species as native to the state. Several species were identified from the descriptions made by the Lewis and Clark Expedition; most however, were collected in the Missouri River below Great Falls by parties working on government railroad surveys. A few collections were made by the U.S. Bureau of Fisheries. Commenting on the common names of trout, Dr. Henshall said that he preferred the name of red-throat trout to the rather repulsive name of cutthroat trout. Most Montanans of this period apparently had little concern for either name, it was most frequently called the blackspotted trout or Rocky Mountain trout.

Dr. Henshall also successfully propagated the Montana grayling. This was considered quite an achievement in view of the failures by the Bureau in their attempts to propagate the Michigan grayling.

The brook trout stocked in many lakes and streams of the state by the Bozeman fish hatchery were reported to be thriving and producing excellent sport fishing in 1905-06. During this same period, the U.S. Bureau of Fisheries planted several million Lake Superior whitefish in Flathead Lake and introduced large numbers of steelhead trout into state streams. In a bulletin published by the University of Montana in 1906, Dr. Henshall listed the species of fish stocked by the Bureau in Montana. These included Lake Superior whitefish, rainbow trout, brown trout, lake trout, brook trout, largemouth bass and smallmouth bass.

Senator W. A. Clark built a private fish hatchery at Columbia Gardens near Butte in 1905. The facility was capable of producing fairly good numbers of fish. While there may have been other private fish hatchery operations in the state, this was the first of consequence. Fish from the Columbia Gardens Hatchery were given to the Butte Anglers Club which, in turn, had the Deputy Game Warden distribute the fish to suitable waters of the area. The operation was cited as just one example of the fine spirit of cooperation that existed between the sportsmen and the Fish and Game Department.

The first resident hunting and fishing license was adopted in 1905, despite considerable opposition from the public. The cost of the license was $1.00 and only one license per family was required. With the new licensing system, Department clerical work increased and additional office help was hired in Helena. There was a total of 500 license accounts to process - 300 Justice of the Peace and 200 Special Deputy accounts. The number of licenses sold in 1905 was 30,220. Receipts for the year were $30,593.50 and expenses were $16,788.44. The 1906 receipts were $24,491.13 and expenses $17,410.95.

1907-08

The first non-resident fishing license was adopted in 1907. This brought increased revenue to the Department and aided in determining the number of out-of-state anglers. The cost of the non-resident fishing license was $1.00.

In the U.S. Bureau of Fisheries Document No. 628, 1907, Dr. Henshall wrote, "Grayling originally existed only in the tributaries of the Missouri River above Great Falls and was first noticed by Lewis and Clark on their expedition. It was rediscovered by James W. Milner in 1872 in a tributary of the Missouri River near Camp Baker, Montana. He described it and named it Thymallus montanus. Probably the Arctic grayling was the parent stock, transported south during the Glacial period; a theory strengthened by the abundance of grayling and lake trout in Elk Lake - the latter nowhere else west of Lake Michigan". The Montana grayling is now considered to be identical to the Arctic stock and is named Thymallus arcticus.

After a number of years of negative action on a state fish hatchery, the legislature finally appropriated funds for the construction of a station to be located at Anaconda. E. P. Mathewson, Chairman of the State Fish and Game Commission and General Manager of the Anaconda Company Smelter, was instrumental in securing the site and having a hatchery building, a residence and an ice house erected. The land occupied by the hatchery and the accompanying water rights were given to the Department by John D. Ryan, President of the Butte, Anaconda and Pacific Railroad (B, A & P), on November 14, 1908. C. F. Healea was placed in charge of the new installation.

1909-10

On January 1, 1909, Governor Edwin Norris named Henry Avare, who was one of the original deputy game warden appointees, to State Fish and Game Warden,

replacing W. F. Scott.

The Anaconda State Fish Hatchery, under the supervision of C. F. Healea, was credited with noticeably increasing the numbers of fish in Montana streams. A rather questionable accomplishment, considering its brief history. Records showed 14,400,000 fish had been planted from the station. Brook trout fry from eggs shipped to Anaconda from Rhode Island were planted in Georgetown Lake in 1908. These fish were now reported to range from 6 to 12 inches in length, with some moving into the inlet streams to spawn. It was expected that brood fish from the same lot of fish, held at the hatchery, should produce approximately a million eggs.

By far the greater part of the production of the Anaconda Hatchery was blackspotted (cutthroat) trout. Large numbers of these fish were widely distributed throughout the state. The results of planting the blackspotted trout was difficult to assess since this species was found naturally in most streams of the state.

The Fish and Game Commission, in 1909, approved payment to the Anaconda Company $9,146.45 which had been advanced the previous year by the Company for fish hatchery operations.

"Fishing trains" were common in parts of the state about this time. These took fishermen aboard early in the morning, then proceeded to drop them off near favorite fishing spots as the train progressed along a stream. In the evening the train would return to pick up the anglers waiting along the way. One popular fishing train started at Great Falls and distributed fishermen along Belt Creek. The Department received a number of complaints relative to the activities of the "train fishermen". Local sportsmen accused them of taking and keeping too many trout, particularly the small trout.

Some fishermen expressed concern over the large numbers of fish concentrated below dams. They felt that these fish should be protected since they were extremely vulnerable to anglers. On the recommendation of State Game Warden, Henry Avare, fishing was prohibited immediately below existing dams. This regulation is still maintained at many dams in the state after more than 60 years. Concern at present is more for public safety and not entirely for protecting fish. Further protective measures made in this period included the elimination of winter fishing and a daily limit of 25 pounds of trout, with a possession limit of 50 pounds.

Millions of Lake Superior whitefish had been, and were still being, stocked in Flathead Lake and other large lakes in the state. It was predicted at the time that Flathead Lake alone would be able to supply the entire state with this exceptionally fine food fish. The Department was confident that these whitefish would do as well in Flathead Lake as they had in the Great Lakes.

Information received by the Department from other states described the rainbow trout and steelhead trout as being quite cannibalistic species. To protect other game fish, a policy was adopted by the Department that henceforth rainbow and steelhead would be stocked only in isolated reservoirs.

There were 50,000 grayling planted in Georgetown Lake by the Bozeman Hatchery in April, 1909. By 1910 these fish were reported to have a maximum length of up to 11 inches and were being taken on flies. The following year the grayling were said to average about two pounds. The Bitterroot, Flathead and Yellowstone Rivers also received plants of grayling in 1909, apparently with less phenomenal results.

State fish distribution was interrupted, to some extent, when the railroad companies in October, 1910, unexpectedly recalled all heretofore free transportation granted the Department. This included the fish car. No reason was given

for the sudden change in railroad policy, but it is likely they felt a lucrative source of income was being overlooked.

Under the license law enacted by the Eleventh Legislative Assembly, everyone was required to have a $1.00 resident license to hunt and fish. This was interpreted to include men, women and children. On the recommendation of the Fish and Game Commission, the law was changed to exempt boys under 14 years and all women.

Large numbers of immigrants were coming to America at this time, and while Montana didn't receive a great many, those who did come added to the problems of the game wardens. According to their reports, the foreign element had no regard whatsoever for fish and game regulations and harvested everything available, including songbirds.

Forest fires in the Bull River area in 1910 resulted in the total loss of trout from large sections of this stream, as well as Beaver Creek and Trout Creek. The water in these streams was said to have been steaming hot in the fire area.

1911-12

The Montana Fish and Game Commission, created by Legislative Act on March 8, 1907, was increased from three members to five by a new Act passed February 11, 1911. E. P. Mathewson was President of the Commission. The other members included State Game Warden, Henry Avare of Helena; the Secretary, Major G. E. Doll of Helena; Major M. D. Baldwin of Kalispell and Judge W. M. Bickford of Missoula.

Sportsmen in the northwestern part of the state maintained that fish hatchery facilities were not adequate to provide desirable fishing in the numerous lakes and streams of their area and they strongly urged the Commission to construct a fish hatchery in the Flathead region. Funds for a hatchery were appropriated by legislative act in February, 1911. After investigation of several

probable sites, a location near Somers on the Cramer Ranch was finally selected. The land was donated by Flathead County and the architect for the project was J. B. Gibson of Kalispell. The unit consisted of a hatchery building 38 feet by 84 feet, with 40 cement troughs; a bungalow type residence 32 feet by 42 feet; an ice house 20 feet by 24 feet and a garage 22 feet by 24 feet. Capacity of the new station was estimated to be 3 million trout. A battery of whitefish jars was said to be capable of producing from 8 to 10 million fish. A 6-inch wooden pipeline carried spring water about 3,000 feet to the hatchery. The water head was 228 feet. Construction of the hatchery was completed in 1912 and production was scheduled for the following year.

PICTURE OF THE SOMERS HATCHERY

P.36 1913-14 BIENNIAL

PICTURE OF THE SOMERS RESIDENCE

P.164 1913-14 BIENNIAL

The residence at the Anaconda Hatchery was remodeled and enlarged in 1912 and an addition of 15 feet was made to the hatchery building to provide room for an office and shop. This was the first year that the Anaconda station kept accurate records of all operations. During the 1912 season the hatchery distributed 660,000 grayling; 16,350 rainbow trout; 1,299,200 brook trout and 2,604,500 blacksoptted trout. All of these fish were planted as fry.

A report of the misuse of state funds was investigated at the Anaconda Hatchery and Supervisor C. F. Healea was relieved from duty. J. D. Dean, formerly with the Federal Fish Hatchery at Bozeman, was hired in March, 1912, to replace Healea. The salary of the Hatchery Supervisor was raised from $1,800 to $2,500 per year by the Commission.

Through the efforts of Senator Myers, Montana received over 2.5 million cutthroat trout eggs from the U.S. Bureau of Fisheries operations in Yellowstone National Park. It was necessary to build two new tanks and two troughs at the Anaconda Hatchery to handle all of the eggs. Hatchery Superintendent Dean reported that the total loss, from eyeing to distribution, was only 12 percent.

The Department was confident that by 1913, test netting in Flathead Lake, Whitefish Lake and McDonald Lake would confirm the successful establishment of Lake Superior whitefish.

Since the Dolly Varden trout was known to be very destructive of fish life, regulations were changed to permit the taking of these fish with nets.

Upper Two Medicine Lake, previously barren of fish, was stocked in 1912 with 20,000 brook trout fry.

The Butte, Anaconda and Pacific Railroad Company donated a railroad car to the Department in 1911 for fish distribution. The car was remodeled to include sleeping quarters, cooking facilities and air pumps. During the 1912 season, the car traveled 8,084 miles on fish planting trips and 2,500 miles on messenger trips. The fish car provided and efficient method of transporting fish over fairly long distances at a time when there were no super highways or large diesel powered tank trucks. The use of railroad fish cars for distribution was pioneered by the U.S. Bureau of Fisheries. Most states later adopted the practice. Success of the operation demanded careful timing. Once the route of the fish car was estab-

lised, it was important that the sportsmen's groups or individuals scheduled to receive fish, meet the fish car and pick up the cans of fish at the appointed time and place. It was the responsibility of those receiving the fish to transport them to the designated lake or stream or, sometimes to other waters of their choice.

PICTURE OF RAILROAD FISH CAR

P.3 1917-18 BIENNIAL

PICTURE OF RAILROAD FISH CAR INTERIOR

P.31 1917-18 BIENNIAL

Practically every accessible water in the state received fish of some kind - at the discretion of the planter and without regard to actual need or desirability. Scientific bases for fish stocking was still well in the future. Other than for relatively broad regulations which set limits and closed seasons or areas, fisheries management consisted exclusively of rearing and planting fish. Many of the fish introductions provided excellent fishing, particularly those introductions made into barren waters. Some plants were later found to have been unwise; for example, the establishment of brook trout in waters not suited to the species, the introduction of sunfish into good trout lakes, the elimination of native cutthroat and grayling populations through the stocking to rainbow and brown trout. Yellowstone National Park originally had only three species of native game fish; blackspotted trout, mountain whitefish and grayling. By 1911, lake trout, rainbow trout, brook trout and brown trout had been added. Landlocked salmon were introduced into Yellowstone Lake and largemouth bass were planted in lakes of the

Firehole Basin, but neither species became established.

Many millions of Yellowstone cutthroat trout eggs were taken at Yellowstone Lake and shipped to places throughout the world. The Federal Fish Hatchery at Bozeman maintained three eyeing stations in the Park - at Thumb, Lake Creek and Cub Creek. The log book of the Bozeman station contained an interesting description of the spawning operation of 1912. On June 10th of that year, the station assembled all the equipment and personnel needed for the task. The gear was loaded into three freight wagons, each pulled by a four-horse team. The teams, wagons and men were loaded onto railroad freight cars at Bozeman and transported to Gardiner. From Gardiner, travel was by wagon to Yellowstone Lake. The wagons had been on the road only a short time when early June rain suddenly became heavy spring snow. The weather turned bitterly cold and both men and horses were exhausted by the time the Yellowstone Lake station was reached. No special mention was made of the hardships encountered. In spite of the rather cold start, the 1912 season turned out exceptionally well. There were 29,320,500 blackspotted trout eggs taken during the balance of June and July. Montana was well supplied with blackspotted trout eggs through the courtesy of the U.S. Bureau of Fisheries. The Park spawning operations report wouldn't be complete without reference to the very troublesome bears which were a constant menace at the fish traps. One employee commented that the way to handle bears was to give them a good, solid kick in the tail region; if the bear ran off, it was a black, if you ran, it was a grizzly.

Mystic Lake, near Bozeman, was stocked by the Bozeman Hatchery with 6,000 one-inch rainbow trout fry on August 10, 1912. Three years later these same fish averaged 6 to 8 pounds.

In 1913 Governor S. V. Stewart replaced State Game Warden, Henry Avare, with J. S. DeHart. The Commission remained unchanged; E. P. Mathewson, George E. Doll, William Bickford and M. D. Baldwin. The position of Hatchery Superintendent was created this year by the Commission to handle the expanded fish hatchery program and the numerous requests for fish. H. D. Dean was selected to fill the new position.

Quite a few thousand pounds of Dolly Varden trout were reported seined from Flathead Lake in 1913 during the period of legalized netting. Most of the fish were sold in the Kalispell area, bringing from 20 to 25 cents per pound. The Commission felt that a sufficient number of Dolly Varden trout had been taken and it was restored to the game fish category with a daily limit of 50 pounds.

Test netting for Lake Superior whitefish in Flathead Lake proved unsuccessful. This was wholly unexpected since large numbers of this species had been stocked over a span of 14 years - the U.S. Bureau of Fisheries making the first plant in 1900. One theory advanced at the time was that the fish were probably present but were in the deeper waters, out of the reach of the nets.

By 1913 the railroads refused to haul the old fish distribution car because of its dilapidated condition. The legislature appropriated $6,000 for the purchase of a new car which was delivered on August 1, 1913 and made its first trip with fish on August 18. The new unit was patterned after the government fish distribution cars with living quarters aboard. During this year, the original fish car, obtained from the B, A and P, traveled 6,639 miles; the new car 21,455 miles.

The two state fish hatcheries, at Anaconda and Somers, now propagated cutthroat trout, brook trout, rainbow trout, grayling and whitefish. Fisheries Superintendent, H. D. Dean, reported that 15 million fry were liberated from the

Anaconda Hatchery during the season. All that was needed to make a complete state operation, according to the Commission report, was a fish hatchery in the eastern part of the state to stock pike, perch, bass, catfish and other warm water species.

At the Anaconda Hatchery, 40 new concrete troughs were constructed, the water supply was changed into a closed system, a new whitefish battery was installed and an aquarium was added. The Department officially thanked the Anaconda Company for the labor and roadwork involved in improving the entrance to the hatchery. Both the Anaconda and Somers stations received new 1913 Ford motor cars.

At the Somers station, an electric light plant was installed and a new 250-foot dock constructed. A 31-foot launch, capable of hauling 50 cans of fish at a trip, was purchased for transporting the cans of fish from the hatchery to the town of Somers where they could be transferred to the railroad fish car.

The Federal Fish Hatchery at Bozeman stocked 20,000 lake trout in 1913 and 4,000 in 1914. These fish were planted as 3 to 5-inch fingerlings and were from eggs received from Duluth, Minnesota. One-half of the lake trout were stocked in Hauser Lake, the balance in Glacier National Park. This same year, the Bozeman station received 500,000 brook trout eggs from the Federal Fish Hatchery at Leadville, Colorado, and 25,000 landlocked salmon eggs from Maine. There is no record where the 18,000 fry resulting from the Maine eggs were stocked. The grayling operation carried out by the Bozeman station at Red Rock Lake was abandoned in 1913 because of a shortage of federal funding.

The U.S. Bureau of Fisheries was investigating possible sites for a fish hatchery in the Madison Valley in 1913. Locations proposed included O'Dell Creek near Ennis for the rearing of grayling, and South Meadow Creek near McAllister for grayling and rainbow trout.

Experiments at the Somers Hatchery showed there were enough eggs available

from wild sources to supply fish for stocking all of the lakes and streams of their planting area if a method could be found to reduce the large egg losses incurred during transportation. These heavy egg losses were considerably reduced when the eyeing process was accomplished at field stations located near the traps. Approximately 650,000 native cutthroat trout eggs were eyed at Fish Lake near Stryker with very good results.

The brook trout brood stock held at the Anaconda Hatchery produced half a million eggs in 1913. An additional half million eggs were purchased from commercial dealers. In 1914 the Department purchased 3,562,000 brook trout eggs, then exchanged 2,000,000 of these eggs with Michigan for rainbow trout eggs. It was deemed more economical to purchase the brook trout eggs from eastern dealers than to take them from local fish populations. The U.S. Bureau of Fisheries furnished the Department 200,000 eyed brook trout eggs in 1913 and the same number in 1914. Brook trout were exhibiting good growth in Montana. Fish weighing up to 4 pounds were being caught in Georgetown Lake and some up to 19 inches in length were taken at Lake Ronan. Judge Bickford stated that the brook trout planted in the Blackfoot River in May, 1912, averaged nearly 2 pounds in the fall of 1914. Brook trout had now been in Montana waters for 20 years.

Rainbow trout had adapted well to the lakes and streams of the state. Rainbows weighing from 6 to 10 pounds were caught in the Big Hole River. A record fish of 17 pounds, 2 ounces was taken by a Mr. Swanson near Maiden Rock on the Big Hole River. A 12 pound rainbow was reported from Georgetown Lake. A native of Pacific Coast streams, the rainbow trout had been in Montana for 16 years. It was able to survive in somewhat warmer waters than the brook trout and was also less cannibalistic.

Large numbers of grayling eggs continued to be available through state spawn-taking operations. In 1913 the Department furnished the Columbia Gardens Hatchery with a million grayling eggs to provide fish for stocking the Butte

area. Lake plants of grayling were producing excellent results but the stream plants were generally unsuccessful.

The native whitefish was still abundant in Montana waters but was reported to be declining in numbers since it was not propagated or protected. These reports were probably incorrect. In the fall of 1914 the Somers Hatchery took 400,000 mountain whitefish eggs at Big Fork, where the Swan River empties into Flathead Lake. These eggs were placed in hatching jars. This operation constituted the first mountain whitefish propagation in a state fish hatchery.

At the Anaconda Hatchery, in the spring of 1914, lethal runoff water from a pile of leaching ashes entered the water supply system, killing a large number of eggs and fingerling fish. The cinders were removed following the disaster to prevent a recurrence.

Department records showed the following species and numbers of fish planted during the biennium:

SOMERS HATCHERY	1913	1914
Lake Superior whitefish	3,000,000	4,860,000
Lake trout	18,550	4,000
ANACONDA HATCHERY		
Blackspotted trout		1,583,900
Brook trout		1,724,175
Rainbow trout		1,255,950
Grayling		265,000

1915-16

The Federal Fish Hatchery at Bozeman planted large numbers of fish in 1915. Cutthroat, rainbow and brook trout were transferred from the station to railroad fish cars for wide distribution. While Montana waters received a large share of the fish, some were planted by the Oregon Shortline Railroad; others were shipped

to Salt Lake City, Utah; Spokane, Washington and to Idaho. Fish for a display aquarium were sent to the Pacific Exposition and a shipment of rainbow trout was sent to Panama. The Bozeman station received 200,000 brook trout eggs from Lehighton, Pennsylvania in 1915. The fry from these eggs (26 cans) were sent by fish car to Red Lodge for distribution in the waters of that area.

To protect and preserve Montana's excellent sport fishing, a law was enacted in 1915 setting a daily limit on game fish. It became unlawful to take more than 25 pounds of game fish, or to take more than 10 fish less than 6 inches in length, in one day.

Improved fishing opportunities were anticipated for the 1916 season with the completion of Hebgen Reservoir on the Madison River near West Yellowstone.

Several state streams received plants of steelhead trout on April 15, 1916, from the Federal Fish Hatchery at Bozeman. The steelhead eggs were secured from Clackamas, Oregon. The Bozeman station also shipped 81 cans of brook trout (200 fish per can) and 36 cans of rainbow trout (1,000 fish per can) to Glacier National Park on September 4, 1916. The Park Service hoped to improve the quality of sport fishing in the waters of the Park through expanded stocking operations.

1917-18

The Fish and Game Commission for the 1917-18 biennium under Governor S. V. Stewart was composed of J. L. Kelly, Chairman; M. D. Baldwin; Nelson Storey, Jr. and W. M. Bickford. State Game Warden, J. L. DeHart was Secretary of the Commission.

The cost of a resident hunting and fishing license was increased in 1917 from $1.00 to $1.50.

The legislature appropriated $17,000 for the purchase of a new fish distribution car. The old car, "Thymallus", was considered unsafe and in need of replace-

ment. The lowest bid received for a new railroad car was $24,600, the highest, $50,000. The Northern Pacific Railway Company solved the problem through the loan of a fish car to the Department.

The automobile was extending the range of state anglers considerably. Waters that were once remote and inaccessible, were now within the reach of more fishermen. Because of the increased fishing pressure, the Department planned to put increased effort into the fish planting program, with special emphasis on waters barren of fish.

Systematic fry planting was continuing to produce good fishing but the Department thought more care could be exercised in selecting the species of fish to be planted. Better results would prevail if prior investigation of the waters to be planted were made. Henceforth, applicants for fish would be required to furnish information on the physical characteristics, irrigation diversions, pollution, etc. of the waters to be planted. Examples cited which showed poor planing included the transplanting of bass from Echo Lake into the Flathead River and the stocking of brown trout into the Madison River. Records failed to show when brown trout were first introduced into the Madison River but quite probably they came from early introductions into Yellowstone National Park in 1889-90. Brown trout were now reported to be present in the Madison in fairly large numbers and concern was expressed that the brown trout would prove detrimental to the grayling. Future plants of trout were to be restricted to cutthroat and rainbow trout and grayling.

The Department commended the many sportsmen's organizations for their assistance in stocking fish. Members of these groups were encouraged to provide information on stream conditions, locate suitable fish planting sites, help to enforce the 25 pounds per day limit and prevent the use of traps, nets and explosives. Formation of sportsmen's clubs was strongly urged. Support of Department activities

and policies by the sportsmen however, was not unanimous. Largely due to club efforts, a bill was introduced in the 1917 Legislature to abolish the Fish and Game Department and turn the duties over to the county sheriffs. Fortunately, the bill was defeated.

Diverters of water from state streams were still not installing fish screens or excluders and fish losses to ditches and canals continued. There were also a number of dams being constructed in the state and, while the law specifically required the installation of fish ladders, the actual need was questionable and the issue was not forced. The ladder at the Divide Dam on the Big Hole River, for example, was never used by the fish. Some dams were considered a benefit to the fishery.

The McNeil Brothers were permitted to seine carp from Lake Bowdoin during the fall of 1917 and the winter of 1918. With beef in short supply in the state, the fish were deemed to fulfill a need for meat. The carp was never highly prized by most Montanans and, even though it was plentiful and inexpensive, it was little utilized.

Property owners adjoining the Somers Hatchery claimed water rights and allowed their cattle to trample the springs which provided the hatchery with water. Additional pipe was installed to keep cattle out of the springs and also to prevent warming of the water during the summer months. The Commission proposed to select another site in the area for the hatchery if conditions at Somers didn't improve.

Spawning stations were developed by the Department as opportunities arose, making the state fish hatcheries less dependent on outside sources of fish eggs. It was still necessary however, to purchase some of the eggs needed from commercial dealers. Part of the eggs taken at the fish traps on Willow Creek, a tributary of the Madison River, by the U.S. Bureau of Fisheries were furnished to

the Department in return for a man to patrol the traps.

In the fall of 1916, the Department purchased a million eyed Chinook and Quinnat salmon eggs from Bonneville, Oregon. Half of these eggs were hatched at the Anaconda Hatchery and half at Somers. The fry from these eggs were planted in the Clearwater Lakes on August 12, 1917. Approximately a year later (July 6, 1918) these salmon were 13 to 16 inches in length and weighed from 1 to 1¼ pounds.

A Department spawning crew seining in Lake Ronan in November, 1918, to obtain brook trout eggs, was surprised to find a number of blueback salmon (kokanee) in their nets. The male salmon were described as being bright red in color, humpbacked and having hooked jaws with many sharp teeth. The female was said to be more troutlike in appearance. These salmon were spawned and about 50,000 eggs taken. There were no previous records of blueback salmon plants in Lake Ronan and it can only be assumed that they came from eggs that had been mixed in with the shipment of Chinook salmon eggs from Oregon in 1916. The salmon from this lot of Oregon eggs were planted in Lake Ronan and Foys Lake on May 14, 1916, and were entering the catch in 1918. By September of 1919, these fish weighed as much as 14¼ pounds in Lake Ronan. In October of 1919, mature fish from this plant were reported by the Somers Hatchery Superintendent Eli Melton, to have died and washed ashore in Lake Ronan and one bay in Flathead Lake. Apparently the fish had been planted in Flathead Lake at the same time Lake Ronan and Foys Lake were stocked, although the introduction was not reported previously.

The Oregon Department was very much interested in the success of the blueback salmon in Montana. They had been trying for a number of years to establish this fish in Oregon waters.

A fish display building was erected by the Department at the State Fair Grounds in Helena. The purpose of the display was to show the public the various species of fish cultivated in Montana and also to encourage the use of some of the

less utilized species. Details of the display were not reported, but Hatchery Superintendent Eli Melton, was credited with the design and construction of a large aquarium in the building. In addition to being a competent fish culturist, Melton was also an expert glazier.

The overall fisheries program in the state received new interest. Past practices were evaluated and new plans were made for the future. The Bitterroot River fishery showed that good populations of cutthroat trout, whitefish, squawfish and suckers were present while over the years, brook trout, grayling, rainbow trout and steelhead trout had been the only species regularly stocked. Grayling had failed to become established in the Bitterroot, and only very small numbers of the other stocked species were found. Future fisheries management plans included, (1) a compilation of the lakes, streams and rivers of the state; showing the kinds of fish, characteristics of the water, sources of pollution, the number of fry plants made and the results of the plants; (2) instruction of all sportsmen's clubs and individuals involved, in the proper methods of fry planting; (3) the stimulation of interest in the construction of breeding or holding ponds.

The Department announced plans to cooperate closely with the U.S. Forest Service in the introduction of fish into barren waters located on the National Forests within the state.

In evaluating the fish planting program, the Department recognized that there was greater survival when larger fingerlings were stocked but the higher costs of rearing and distributing the fish discouraged such practice.

The Federal Fish Hatchery at Bozeman erected a small auxillary station at McAllister in 1917 to facilitate operations on the Madison River. Another auxillary unit was planned for Glacier National Park. The Bozeman station obtained a large number of brook trout eggs in 1917 and stocked fry from these throughout the waters of the Madison Valley

1919-20

Governor Joseph Dixon named T. N. Marlowe to replace long-time Commission member, W. M. Bickford, in 1919. J. H. Brunson was appointed Superintendent of Hatcheries on March 21, 1919, and reported for duty on November 18, 1920.

Montana experienced a severe drought in 1919. Many of the smaller streams were completely dry. The Fisheries Division nonetheless, reported a relatively active year. A new state fish hatchery was nearing completion at Emigrant. The station had 12 troughs and a battery of 25 jars for hatching whitefish or grayling. An electric light plant was purchased for the Emigrant unit and bids were advertised for construction of an ice house, garage and shop.

PICTURE OF EMIGRANT DWELLING AND HATCHERY

P.26 1919-20 BIENNIAL

At the Anaconda Hatchery, 60 concrete troughs were installed, the springs tiled and the buildings painted. The Georgetown Lake operation secured nearly 20 million grayling eggs and several million cutthroat eggs in 1919.

The Western Montana Fish and Game Association of Missoula built a fisheries station and living quarters at Salmon Lake. The station had approximately the same capacity as the new Emigrant Hatchery.

A small fish hatchery unit was erected by the Department at Hebgen Dam and the racks and traps put in place in May, 1919. During the winter of 1919-20 the installation was completely destroyed by a snow slide. Rather than face the same hazard in the future, the Department planned to rebuild at a location on the West

Fork of the Madison River.

The Department leased a private fish hatchery on the Dearborn River for several years and also maintained a temporary fisheries station for taking and hatching grayling eggs on O'Dell Creek. High water in the spring of 1920 washed out the O'Dell Creek operation, along with a small dam on the creek.

The Department now operated a total of 12 fisheries units including hatcheries, egg taking and eyeing stations. No recorded information was found as to the number of private fish hatcheries in existence at this time, or is it known how many fish they produced or where they were planted. Private hatcheries operated by sportsmen's groups generally made plants of fish wherever they desired. The Department was dissatisfied with this situation but was unable to provide a solution. It was totally impossible, because of the costs involved, to put all of the private fish hatchery operations under Department supervision, or to furnish eggs for all of them.

1921-22

T. N. Marlowe was Chairman of the 1921-22 Commission, with other members E. A. Wilson, H. C. Crippen, J. L. Kelly and John A. Tressler. C. A. Jakways was State Game Warden and J. H. Brunson was Superintendent of Fisheries.

Rearing ponds were considered an excellent and logical method of keeping streams well stocked with trout. The program was widely publicized by the Department and quite a few were constructed. What system could possibly be more economical than placing fry in a controlled rearing pond, letting them grow on natural food and then releasing the fingerlings into an adjacent stream or lake? Four rearing ponds at Greenough Park in Missoula, supervised by the Western Montana Fish and Game Association, were planted with 80 cans of trout fry in June and July, resulting in 400 cans of fingerlings in October. Other rearing ponds established at

about the same time as those at Missoula included one near Bozeman on the West Gallatin River, one near Belgrade, one near Emigrant and another near Ovando. The latter was said to be teeming with freshwater shrimp.

The Department had long contended that because of high distribution costs, it was more economical to operate a larger number of small fish hatcheries spread around the state, than to operate a few large hatcheries. The Department was supported in this contention by most sportsmen and communities because they hoped to have a fish hatchery located in their own particular area. The City of Lewistown, through the Rod and Gun Club, raised $1,200 in cash and provided a hatchery building and free water for a station at Big Springs. On July 7, 1922, the Department sent K. F. Mac Donald to Lewistown to begin operations at the hatchery. He arrived to find the station without equipment. Cattle and horses were in residence on the porch and several of the windows were broken. He evidently took care of the situation as he received 246,750 rainbow trout eggs on July 11th and 468,720 cutthroat trout eggs on July 15th from the Anaconda Hatchery. The eggs must have hatched and been planted almost immediately. The station records show that rainbow and cutthroat trout fry were planted in the Hobson area July 14-17. The Lewistown station was closed for the season on August 31, 1922.

At Great Falls the Montana Power Company gave the Department $3,500, provided a hatchery site near Giant Springs and agreed to furnish free electric power for pumping water. The Great Falls station was completed in 1922 and consisted of a hatchery building, caretakers residence, an auxillary pumping plant and rearing ponds.

The City of Big Timber furnished the Department a hatchery site complete with free water. The operation of the private hatchery built by Marcus Daly at Hamilton was turned over to the Department. W. A. Clark, Jr., donated funds to the Department for the construction of a fish hatchery at Ovando and the Forestry Department granted the Fish and Game Department a fish hatchery site at Red Lodge. In all,

five new fish hatcheries were built during the 1921-22 biennium - Lewistown, Great Falls, Big Timber, Red Lodge and Ovando.

At the Anaconda Hatchery, spring water (57 degrees F.) was piped into the hatchery building to provide better temperatures for rearing fish. The Georgetown Lake unit was expanded to handle the eyeing of eggs. Eyed eggs could be transported with very little loss. Log cottages were built at the lake and also at Flint Creek.

Bass salvage was an important Department operation in the Flathead River drainage. After the river flooded in the spring, bass spawned in the warmer, shallow overflow waters. As a result, many small bass were stranded in the temporary pools that were left when the water receded. These pools were seined and the fish transplanted to lakes and ponds in other areas of the state.

Salmon fishing at Lake Ronan was reported as very good. A 36-inch Chinook was caught there in 1922.

1923-24

T. N. Marlowe continued as Commission Chairman under Governor J. E. Erickson in 1923-24. E. T. Richards replaced John Tressler on the Commission. C. A. Jakways was State Game Warden and R. H. Hill was his assistant. J. H. Brunson, Superintendent of Fisheries, had as his staff, Dr. I. H. Treece,Field Assistant, Western Division at Anaconda and John W. Schofield, Field Assistant, Eastern Division at Emigrant. Foremen at the various fisheries installations were O. E. Johnston at Anaconda, John W. Schofield at Emigrant, A. G. Stubblefield at Great Falls, J. P. Sheehan at Hamilton, Eli Melton at Lake Ronan, K. F. MacDonald at Missoula and M. L. Matzick at Somers. Twelve units were in operation. Those at Lewistown, Red Lodge, Ovando, Georgetown Lake and Big Timber were operated on a seasonal or part-time basis.

The fish traps at Flint Creek on Georgetown Lake were rebuilt in 1924 and 25 million eggs were taken at the traps that year. Fish traps were also built on four tributaries of Ashley Lake in 1924 and a shelter erected over an eyeing station there. It was predicted that Ashley Lake operations would produce about 4 million eggs in the 1925 season.

Brown trout and grayling eggs were exchanged for steelhead trout eggs in a trade arranged with the Oregon Department. Actually, it was a somewhat indirect exchange. The Montana Department traded 3 million grayling eggs with the U. S. Bureau of Fisheries for 3 million brown trout eggs. In turn, Montana traded 2 million of the brown trout eggs for 2 million steelhead and rainbow trout eggs with Oregon. The Great Falls Hatchery received a million of the rainbow trout eggs and planted the resulting fry in the Missouri River.

As early as 1924, the Department expressed the need for a qualified fisheries biologist. Activities such as the classifying of state fishing waters and directing fisheries studies could not be carried out with existing personnel. The Department hoped that the position could be authorized and filled in the near future, but it was not until 1947 that it became a reality. The Department also proposed that a Division of Education be established to assist in public relations. The Information and Education Division was finally established in 1950.

The control of predators was an important function of the Department. In 1923 the sum of 25 cents was set aside from each license sold and was earmarked as a biology fund. This fund was used in employing hunters and trappers to kill predators.

On June 5, 1924, J. H. Brunson resigned as Superintendent of Fisheries. It was not until April 29, 1925, that former State Game Warden, C. A. Jakways, was named to fill that position temporarily until September 1st of that year.

The Forest Service received at Red Lodge, a shipment of 20 cans of brook trout from the Federal Fish Hatchery at Bozeman on June 29, 1924. These fish were dis-

tributed in lakes and streams of the Red Lodge area.

During the summer of 1924, a survey of the lakes in the Madison River drainage was made by Department personnel. It was reported that none of the residents contacted in the vicinity of Elk Lake knew of any lake trout stocking there. One theory advanced at the time was that the introduction of this species had been made by fish eating birds.

1925-26

Governor Erickson appointed Robert H. Hill State Game Warden in 1925. J. W. Carney was named as his assistant. T. N. Marlowe continued as Chairman of the Commission, with E. C. Carruth and W. K. Moore as new Commissioners.

The Department now operated 14 fish hatcheries - Anaconda, Ovando, Missoula, Red Lodge, Somers, Lewistown, Big Timber, Emigrant, Hamilton, Lake Ronan, Great Falls, Georgetown Lake, Philipsburg and Libby. Many of the stations were operated only as needed in taking eggs, eyeing eggs, or hatching and rearing fry.

PICTURE OF THE STATE FISH HATCHERIES

P.34&35 1925-26 BIENNIAL

The Georgetown Lake station took 37,275,000 cutthroat trout eggs; 16,742,000 grayling eggs; 495,000 rainbow trout eggs and 826,000 brook trout eggs in 1925. The Meadow Creek station, an auxillary of the Federal Fish Hatchery at Bozeman, took 11,750,840 brown trout eggs that same year. The Bozeman Hatchery supplied

the Department with sufficient brown trout eggs to provide fry for stocking the Missouri River above Great Falls and three large reservoirs constructed by the Montana Power Company in the vicinity of Helena.

Both the Department and the U.S. Bureau of Fisheries took cutthroat trout eggs in large numbers. The main egg taking facility of the Department was at Georgetown Lake and that of the Bureau at Yellowstone Lake. To extend the overall period of spawning and hatching operations and facilitate handling a large number of eggs, exchanges of eggs from the two sources were arranged. This worked out exceptionally well as the Georgetown Lake eggs were ready about a month earlier than those from the Park.

The Bozeman station received a shipment of 9,875 landlocked salmon eggs from Craig Brook, Maine, in 1925. While the salmon fry were very likely released into state waters, no record of their distribution was found.

Flathead Lake was planted with Lake Superior whitefish which were hatched from eggs taken at Lake McDonald in Glacier National Park. About 15,000 pounds of the whitefish, averaging 1½ pounds each, were harvested commercially from Lake McDonald in the 1926 season. Many sportsmen and conservationists opposed proposals to take whitefish from Flathead Lake commercially. Those who favored the action however, predicted that objections would soon subside once the fishery proved successful.

On June 4, 1926, a break in the water supply line during the night resulted in the loss of 10,000 rainbow trout and 290,000 cutthroat trout at the Lewistown Hatchery.

Requests for fish continued to increase throughout the state and more fish were being produced with the increased number of fish hatcheries. Distribution of fish presented difficulties however, and the Department was investigating means of expanding the fish transporting system.

PICTURE OF FISH DISTRIBUTION TRUCK

P.33 1960-62 BIENNIAL

1927-28

The administration of the Department changed little in the 1927-28 biennium. On the Commission, E. C. Carruth was replaced by G. T. Boyd. K. F. MacDonald was named Superintendent of Fisheries.

A summary of the bass and sunfish salvage operations in the Flathead area, discussed earlier, showed that 406,800 bass and 1,133,628 sunfish had been transplanted in the period from 1921 through 1928. The operation continued to be popular with almost everyone. Here were fish, stranded and doomed to die, that were being rescued and placed in waters where they could live. The advisability or success of the transplants was not reported.

A limited amount of commercial fishing was carried out in the state with varying success. The McNeil Brothers continued to seine carp for eastern markets and were granted permission to extend their operations from Lake Bowdoin to Medicine Lake in Sheridan County and to the backwaters of Nelson Reservoir in Phillips County. Thomas Medanich received a permit to seine carp from Lake Helena. He constructed a pilot fish oil plant near the northeast corner of the lake in 1927 and seined a total of about 30 tons of carp before giving up the venture. Until recently, there were still remnants of his operation on Lake Helena, a site presently occupied by another commercial carp fisherman. Whitefish could be taken legally in Flathead Lake with nets and the fish sold commercially. The fishery was limited however,

as seines were prohibited in less than 30 feet of water.

Funds were appropriated by the legislature for the Miles City Pond Culture Station. Construction began in July, 1927, and the unit was completed in March, 1928. A warm water fish hatchery had long been proposed by the Department as a means of stocking the ponds and lakes of eastern Montana. A dam 590 feet long, 10 feet high and 10 feet across the top, created a 78-acre hatchery pond. The dam had a spillway 30 feet wide which was fitted with a drain box. Water was supplied by an artesian well flowing 12 gallons per minute. When the hatchery was ready for operation, the U.S. Bureau of Fisheries furnished 199 cans of bass, sunfish and crappies. In the spring of 1928, the fish hatchery at LaCrosse, Wisconsin, shipped 375 adult largemouth bass to the Miles City unit. These fish were held in the pond and 5,000 fingerlings were harvested in October. The fingerlings were planted in the Upper Tongue River and in farm ponds near Terry, Rosebud and Cohagen.

The Federal Fish Hatchery at Bozeman had a record year in 1927. The station handled 32,190,966 fish and eggs; of which, 14,400 were brown trout.

The state fish hatcheries and personnel in 1927-28 were:

Big Timber - Iver Hoglund, Foreman - Ed Gunderson, Assistant
Great Falls - A. G. Stubblefield, Foreman - S. A. Hamann, Assistant
Anaconda - K. F. MacDonald, Foreman - E. A. Allen, Assistant
Emigrant - Oren Hathaway, Foreman - A. E. Tangen, Assistant (3/21/28)
Lake Ronan - Leo Gilroy, Foreman
Somers - M. L. Matzick, Foreman - Elmer Phillips, Fish Culturist
Missoula - O. E. Johnston, Foreman
Hamilton - J. P. Sheehan, Foreman
Station Creek (Polson) - Eli Melton, Foreman

Hatchery personnel also manned temporary fisheries stations at Lewistown, Red Lodge, Georgetown Lake, Libby and other sites. The fish hatchery at Columbia Gardens continued to be operated by the Butte Anglers Club.

In 1928 the Commission entered into a cooperative agreement with the University of Montana at Missoula to investigate fish foods present in Flathead Lake. The project lasted until 1931 and the results were published by the Department. The studies

were carried out at the University Biological Station located at Yellow Bay on Flathead Lake. Historically, the Station has an interesting background. It was first envisioned by Dr. M. J. Elrod who had come to the University in the fall of 1897 as a professor of biology and saw an opportunity to study flora and fauna indigenous to Flathead Lake and the surrounding country. Dr. Elrod was also chairman of the first Fish and Game Commission and served on that body for a number of years. The Yellow Bay Station was established in the fall of 1899 and consisted of a small wooden building on five acres of land leased by the University at the mouth of the Swan River at Big Fork. The Station operated at this location until 1912, when a building was completed at Yellow Bay on land granted in trust to the University by the federal government. From 1912 until 1921, summer work was carried on at Yellow Bay by students, staff and visiting investigators. Owing to lack of funds and other difficulties, work was discontinued in 1921 and the Station was idle until the joint project was agreed upon in 1928. Since 1931, the Station has been used for classes which could benefit by studying there. Modernization and expansion in recent years has made Yellow Bay an integral part of the University training and research program.

1929-30

There was no change in the Commission membership or in Department administration under Governor Erickson in the 1929-30 biennium.

The Department was making adjustments in the fish stocking program to include more 6-7 inch fish for stream plants. Returns to the angler were much better when larger fish were planted. The Department reported that most of the larger fish needed could be obtained at little added expense by expanding the rearing pond program.

A new fish hatchery and spawning station was completed at Lake Francis in 1929 as an auxillary to the Great Falls Fish Hatchery. The new unit was considered one

of the most modern rainbow trout spawning stations in the nation. The great expectations were never realized at Lake Francis. Records for the station show a general decline for the period of operation. Expenditures were $13,000 in 1929; $8,000 in 1930; $1,700 in 1931 and $860 in 1932. Only 37,000 rainbow trout were distributed by the station from 1930 to 1933.

What were claimed to be the largest trout rearing ponds in the United States were completed at Maiden Rock on the Big Hole River in 1929. The Butte Anglers Club and the Department cooperated in the construction of the ponds. The Club reported that they helped plant 2½ million fish in 1929.

Probably one of the most active, and certainly one of the oldest sportsmen's organizations in the state, the Butte Anglers Club had existed since 1902. Its first president was Judge W. M. Bickford who later, in 1910, was appointed a member of the Fish and Game Commission. The Club started out with 60 members and had over 1,000 when it incorporated in 1916. Time, labor and the use of their automobiles were contributed by Club members in planting fish and carrying out other projects. They operated the Columbia Gardens Fish Hatchery continuously, beginning in 1905. Under the watchwords of the Club; propagation, protection and conservation, the group worked harmoniously with state and federal agencies.

Dr. D. R. Crawford of the University of Washington Department of Fisheries, was hired by the Montana Department to make a survey of the fish hatchery system in the state. His investigations were carried out during the three-month period - June 24 through September 24, 1929. Briefly, his findings and recommendations were:

The Anaconda Hatchery was the best equipped Montana station but did not have an adequate water supply.

The Rock Creek Hatchery, an auxillary of the Anaconda Hatchery, should be retained as a temporary station. While the buildings and the site were poor, the location would be helpful in the distribution of fish.

The Big Timber Hatchery had an adequate water supply which warranted the enlargement of the station from 34 troughs to 64 troughs.

The Emigrant Hatchery, an auxillary of the Big Timber Hatchery, had insufficient water; abandonment of the station was recommended.

The Red Lodge Hatchery, also an auxillary of the Big Timber Hatchery, was dependent upon the city water supply and access to the station was poor. Abandonment of the site was recommended.

The Lewistown Hatchery had an abundant water supply of excellent quality, but there were very few places to plant the fish. It was recommended that the Lewistown site be abandoned and the fish supplied from Big Timber and Great Falls.

The Great Falls Hatchery served an extensive area and warranted enlargement. The water supply at the station was low in dissolved oxygen.

The Missoula Hatchery, Greenough Park, received its water supply from Rattlesnake Creek. Since most of the water from the stream was required by the City of Missoula, little was left for the operation of the hatchery. Daytime water temperature in the ponds was warm. Abandonment of the site was recommended.

A number of other pond sites and proposed hatchery sites were investigated by Dr. Crawford but were found generally unsuitable.

The Department purchased the 17½-acre Anderson Fish Hatchery located near Emigrant for $8,000 in 1929. The hatchery was a private operation owned by George Miles, a brother of Senator Miles. Movement of the Emigrant Hatchery to the Anderson site was accomplished in 1931.

The Miles City Pond Culture Station was authorized to construct a new cottage. The cost of the building was not to exceed $1,000 and it was to be built by hatchery personnel.

In July of 1929, the St. Ignatius Rod and Gun Club planted eyed cutthroat trout eggs in the lakes of the Mission Mountains. The Department sent F. M. O'Brien to assist the sportsmen in the stocking. On July 3, 1929, the Icefloe Lakes were planted with 120,000 eyed cutthroat trout eggs; Falls Creek Lakes with 48,000 and two unnamed lakes with 12,000 and 15,000 respectively. Gray Wolf Lake was stocked with 230,400 eyed cutthroat trout eggs on July 7, 1929. This particular stocking project was initiated because of the successful introduction of eyed cutthroat trout eggs into previously barren Snielman Lake in 1925 and the good catches of cutthroat from this lake by 1928.

Judging from random reports, there were a number of private fish hatcheries operating in the state around this period. Since the private operations were not required to have a license or to send production figures to the Department, details regarding their numbers or activities are not available. Verbal reports are vague as to dates, locations and the size of these operations, but it is safe to say the Columbia Gardens station managed by the Butte Anglers Club was the largest. Most of the fish reared in private hatcheries were planted in nearby waters. A few were probably sold to sportsmen's groups for stocking favorite lakes or streams. Many private fish hatcheries ceased operations as regulations were adopted by the Department which affected the stocking and selling of game fish. Changes in water use also gradually affected hatchery water supplies. Remnants of some of the early fish hatcheries still exist. Crumbled pond walls are still visible at a hatchery site on Fishtail Creek above the town of Fishtail. The site was abandoned some time in the early 1920's. Another small private fish hatchery that ceased operations some time prior to 1930, was located on Congdon Creek, a tributary of Ross Fork Creek, near Medicine Lake in the Pintlar area. Only cutthroat trout were raised at this hatchery operated by George Congdon, and all of the fish were planted in the stream and lake nearby. Remains of the old cabin used as a hatchery building are still visible. Other private fish hatcheries that operated during this general period are perhaps familiar locally.

The 1929 fishing season was closed early because of the extreme drought. With the low flows that existed, it was feared that many of the smaller streams would be entirely depleted of fish if they were to remain open. Because the fish were available and waters were closed to fishing, there was a considerable increase in the number of fishing violations. Additional wardens were needed to effectively patrol the critical areas.

The United States Senate approved a bill in 1930 appropriating $50,000 for construction of a fish hatchery in Madison County. President Hoover signed the bill and the Federal Fish Hatchery near Ennis began operations in 1933. The station was needed primarily for brown trout operations.

PICTURE OF MONTANA FISH HATCHERIES

P.34&35 1929-30 BIENNIAL

Prior to 1897, both Loch Leven and Von Behr brown trout eggs were propagated in federal fish hatcheries in the eastern part of the country. For a time, efforts were made to keep the two strains separate, but they were eventually intermixed. W. T. Thompson, Superintendent of the U.S. Fish Hatchery in Bozeman, said that around 1890 the propagation of brown trout was discouraged because of the reported cannibalism of this species and the inferiority of the brown trout to native trout species.

The Butte Anglers Club completed a small fish hatchery unit at Divide, on the Big Hole River, in 1930. The unit was set up in the powerhouse situated on the river. Operation of the 20 troughs and a few hatching jars was supervised by William Carpenter, then President of the Butte Anglers Club.

The McNeil Brothers, using a 3,500-foot net, seined over 14 carloads of carp from Nelson Reservoir in Phillips County during the winter of 1929-30. A carload of carp weighed 30,000 pounds. These were shipped to such eastern markets as New York and Chicago where they sold for from three to five cents per pound.

1931-32

Governor Erickson appointed Charles B. Marrs State Game Warden in 1931 to succeed Robert H. Hill. W. P. Sullivan was Chairman of the Commission composed of B. L. Price, William Steinbrenner, W. F. Flynn and H. P. Stanford. K. F. MacDonald was Superintendent of Fisheries.

Superintendent MacDonald outlined an ambitious and progressive fisheries program. He proposed that each fish hatchery have a capable survey crew to study the streams in their planting area. He pressed for the screening of irrigation ditches and canals, but with no more success than that experienced over the previous 30 to 40 years. MacDonald also suggested that the Department set aside a range area in the state, specifically for the rearing of horses for fish food since there was a continuing decline in the availability of horse meat for fish food. This idea met with disfavor from both the Department and the sportsmen - it didn't fit the image of the horse in Montana. Through MacDonald's efforts, the Department erected a rough fish drying plant at the Clearwater Lakes in 1930. This plant had a capacity of one ton of fish per day. It would provide supplemental fish food for the state fish hatcheries and also reduce the heavy populations of suckers. The plant was scheduled for Lake Francis in 1931, to utilize rough fish there, but evidently the operation was not successful since no further activity of the plant was recorded.

There was a considerable amount of work done at the state fish hatcheries in 1931. The station at Big Timber was enlarged to 72 troughs and a garage and storeroom were added. Additions to the pipeline at the Somers Hatchery did much to improve the water supply system there. A new two-car garage at Somers helped make

the unit more complete. The old hatchery at Libby was abandoned and work was well under way at a new hatchery site about five miles from town on the Kalispell-Libby road. The station at Ovando, which was operated only during the summer, was scheduled for a cottage, garage, storage building and ice house. The various fisheries installations in the state required 76,000 pounds of liver for fish food in 1931.

Foremen at the state fish hatcheries in 1931 were:

Anaconda - Leo Gilroy
Big Timber - J. W. Schofield
Emigrant - P. G. Botteler
Great Falls - A. G. Stubblefield
Hamilton - J. P. Sheehan
Lewistown - L. R. Donaldson
Libby - Elmer Phillips
Missoula - O. E. Johnston
Ovando - T. E. Day
Philipsburg - Graham Cadwell
Polson - Eli Melton
Red Lodge - A. E. Tangen
Somers - M. L. Matzick

A fish rearing station was established on Beaver Creek in the Bear Paw Mountains near Havre in the spring of 1931. Fish reared at this station were transplanted to various streams in the area. The Department sent John Cox to Havre to operate this unit. A Civilian Conservation Corps unit, stationed on Beaver Creek near the rearing station, gave considerable assistance in the rock work and log construction at the site. Two large, rock-walled ponds, a log cottage and two log storage buildings were completed.

PICTURES OF THE BEAVER CREEK SITE

FROM PHOTOGRAPHS

Old records from the Beaver Creek station reflect the financial problems of the Department during the economic depression. Paydays were often delayed and only the most urgent necessities of equipment were purchased. Help at the Beaver Creek unit was provided by the local game warden, area sportsmen and the nearby CCC unit. Problems encountered included flooding in the spring and water temperatures in the summer exceeding optimum levels for rearing trout. The station was maintained by the Department for three years and it was then turned over to the Havre sportsmen's organization. Occasional work parties associated with an annual kid's fishing derby sponsored by the sportsmen, kept the unit in partial repair. Fish planted in the ponds for the derby were released into Beaver Creek following the event. The caretaker for the Beaver Creek Park resided in the cottage for a time and helped to maintain it.

The fisheries station at Greenough Park was closed after the 1931 season. The growing city of Missoula required almost all of the water from Rattlesnake Creek for municipal needs. Another site, to replace the Missoula station, was selected on Marlowe Springs, located about 35 miles north of Missoula.

Rearing ponds were constructed on the Dearborn and Upper Sun Rivers in 1931 although the Department indicated earlier that very few rearing ponds had been successful.

The first eyed golden trout eggs received in the state was a shipment of 50,000 sent to the Federal Fish Hatchery at Bozeman from California in July, 1930. Of the fish from these eggs, 25,000 were scheduled for lakes in the Mission Range. Another 50,000 eyed golden trout eggs were received from California in June, 1931, and 56,025 in June, 1932. The Bozeman station planted golden trout in the South Fork of the Little Wind River in Wyoming on July 1, 1931. On August 23, 1931, the Forest Service received 5,200 one-inch golden trout for stocking the Upper Gallatin River area. A shipment of 6,000 golden trout was sent from Bozeman to the Helena area in September, 1931.

In 1932 the Federal Fish Hatchery at Bozeman received rainbow trout eggs from Neosho, Missouri; Manchester, Iowa; Wild Rose, Wisconsin and Creede, Colorado. Federal hatcheries at Leadville and Creede, Colorado also shipped brook trout eggs to the Bozeman station.

Excellent results were reported by the Department from a transplant of channel catfish from Nelson Reservoir near Malta to Nine Pipes Reservoir near Charlo.

Surplus grayling eggs were exchanged for walleye eggs with the Michigan Department. The walleye were scheduled for Missouri River reservoirs and the Lower Yellowstone and Tongue Rivers.

Belt Creek, recovering gradually from severe mine pollution, was planted heavily with brook and rainbow trout to provide desirable fishing for Great Falls and Belt anglers.

Brown trout plants were increased in the Upper Yellowstone River. Through a cooperative agreement, the Upper Tongue River was also planted with this species by the Wyoming Department.

Substantial plants of brook trout were made in the waters of the Red Lodge-Cooke City area and additional plants were anticipated. The brook trout was considered well suited to these waters and it was stocked in almost all of the lakes and streams of the Beartooth Plateau. Subsequent fisheries surveys have reported populations of stunted brook trout over the entire area.

The Department received many requests from sportsmen to do something to improve the quality of fishing in the Clearwater Lakes which abounded with squawfish and suckers. In a renewed attempt to establish sportfish populations, the Department stocked the lakes with cutthroat trout, rainbow trout and largemouth bass in 1932. No noticeable improvement in sport fishing was reported.

Fisheries Superintendent MacDonald requested additional permanent personnel for the fish hatcheries as the temporary help available was not always reliable. Additional help at the hatcheries would permit the regular personnel time to study the fishing waters and general conditions of their planting areas. The information obtained on each body of water in the state would be filed for later use in the fish stocking program.

Under an agreement with the U.S. Bureau of Fisheries, January 1, 1933, that agency assumed the responsibility for operation of the Miles City Pond Culture Station - with the exception of the custodian's salary. On that same date, the Bureau also agreed to supply the Department with two million brown trout eggs from their Madison River trapping operations.

Through the efforts of the Department and interested sportsmen, fishing success was reported to be improving in many state waters. Plants from the Butte Anglers Club Maiden Rock station were credited with improved fishing on the Big Hole River. As a result of Department planting programs, kokanee were increasing in Flathead Lake and brown trout in the Yellowstone River. The excellent brown trout fishing in the Missouri River was more accessible to fishermen with the completion of the new highway between Helena and Great Falls.

The introduction of sunfish into Lake Ronan was soundly condemned by the Department. It is quite possible that the introduction resulted from the bass and sunfish salvage operations which were still being carried out from the Somers Hatchery.

Dr. H. B. Foote, Sanitary Engineer for the State Board of Health, reported that the incidence of stream pollution was increasing in Montana. Much of the increase resulted from domestic rather the industrial wastes. Streams reported to be heavily polluted in some sections were Silver Bow Creek, Milk River and Yellowstone River.

A permit was granted in 1932 for the operation of a fish processing plant at Lake Helena. Fish meal produced from carp and suckers would be used in the preparation of fish feed. The operators of the plant were to determine the long-range availability of rough fish from the lake. The unit never did really get into operation and little was actually accomplished. No reference was made as to the availability of rough fish. If the fish populations of that date were similar to those of recent years, availability would have been the least of their problems. A commercial fisherman has been seining and marketing tons of carp and suckers from Lake Helena each season for over 10 years with no evidence of a diminished supply.

Many of the smaller streams in the state were dry due to the severe drought experienced during 1931-32. Some were excellent trout streams. As a consequence, fish salvage was a quite common emergency activity for Department personnel and sportsmen's groups.

Along with the problems associated with the drought, the Department had to cope with the economic depression occurring at the time. The total income of the Department in 1931 was $223,655. In 1932, receipts dropped to $179,644. Lay-offs of personnel and delayed paydays were common occurrences.

1933-34

In 1933, under Governor Frank H. Cooney, W. P. Sullivan continued as Chairman of the Commission, which included William Steinbrenner, W. F. Flynn, Ray G. Lowe and W. C. Keil. J. W. Carney was State Game Warden and K. F. MacDonald Superintendent of Fisheries. Foremen at the state fish hatcheries were:

Anaconda - A. G. Stubblefield
Big Timber - J. W. Schofield
Hamilton - J. P. Sheehan
Emigrant - J. P. Campbell
Great Falls - Leo Gilroy
Libby - Elmer Phillips
Ovando - George Miller

Phillipsburg - Graham Cadwell
Polson - O. W. Link
Red Lodge - Melvin Hoglund
Somers - Eli Melton
J. H. Chartrand was Superintendent at the Miles City station

Spawning stations were operated on Flint Creek, Stewart Mill Creek, Ashley Lake, Rogers Lake, Hebgen Lake, Lake Ronan and Lake Francis. On September 11 and 12, 1933, Sam Drew selected sites for Department fish traps above Hebgen Reservoir on the Madison River, on the South Fork of the Madison River and on Duck Creek. Traps were installed at the sites and the first eggs taken on October 15 from the Madison River and Duck Creek. The 344,560 brown trout eggs secured were sent to the Anaconda Hatchery.

PICTURES OF MADISON RIVER AND DUCK CREEK TRAPS

P.23&25 1933-34 BIENNIAL

The Federal Fish Hatchery at Ennis operated several spawning stations on tributaries of the Madison River: Meadow Creek, ¼ mile above the mouth; Spring Creek, ¼ mile north of the Thexton Ranch; Upper O'Dell Creek, opposite 8-Mile Ford; Lower O'Dell Creek, at the mouth north of Jeffers. Brown trout spawning operations began on October 11, 1933, and resulted in over 22 million eggs for the season.

The Department purchased the Marcus Daly Fish Hatchery at Hamilton in 1933 for $4,500. This station had been operated by the Department since 1922 under a lease agreement. When Marcus Daly built the hatchery in 1918, the cost was $30,000.

While the economic depression of the 1930's slowed many Department activities, some projects actually benefited. A large number of construction projects which might not otherwise have been possible, were accomplished at various fish hatcheries

through the relief work programs of the Civil Works Administration and the Federal Economics Recovery Administration. Circular, 40-foot, concrete ponds were constructed at the Great Falls, Anaconda and Somers stations. A large rearing pond was completed, the grounds landscaped and an addition made to the hatchery at Big Timber. Development work was done on the springs supplying water to the hatchery at Somers. Two rearing ponds and four fry ponds were constructed in addition to improving the water supply system at the Hamilton station. Sportsmen provided help and materials in the construction of two large, rock-walled rearing ponds at the Lewistown Hatchery. Improvements to the water supply system, construction of four large ponds and landscaping was in progress at the new Libby Hatchery. Log construction was being utilized in the building of a new bunk house, garage and storage building at the Flint Creek traps on Georgetown Lake. The old hatchery building at Red Lodge was dismantled and a new log building erected there. Predictions were, that the Red Lodge unit would prove to be a valuable adjunct to the fish hatchery system. A considerable number of improvements were made in the ponds and buildings at the Miles City station. Some work was also done at the Salish site, on Marlowe Springs, between Ravalli and Arlee.

On the other hand, the economic depression was reported responsible for a decrease in the number of eggs taken at the traps on Georgetown Lake in 1933 due to over-fishing by the large numbers of unemployed workers from Butte, Anaconda and Philipsburg.

A rough fish control project on Georgetown Lake resulted in the removal of 48 tons of suckers in 1933 and 74 tons in 1934. The fish were taken in "plant nets". Since suckers were first reported in Georgetown Lake in 1926, it had shown remarkable speed in populating the lake.

Silver salmon eggs received January 1, 1933, at the Lewistown Hatchery were reported to be bursting on January 18, rather than hatching normally. Similar results were reported later in attempts to hatch silver salmon in the relatively

warm waters of the upper hatchery at Lewistown. More recent shipments of silver salmon eggs were successfully hatched at the lower hatchery unit at Lewistown where the water is somewhat cooler.

Public Works Administration (PWA) projects throughout the state included construction of a large number of stockwater and irrigation reservoirs - many of which still provide fine fishing. With the large number of dams being constructed, the Department proposed a set of regulations which would govern the operation of reservoirs to be stocked with fish. Fish screens were to be installed at all reservoir outlets and minimum low water levels were required to provide sufficient water to sustain fish life. Where fish were present in feeder canals, sufficient water was required to sustain the fish. While the intent was good, these regulations were never implemented, probably because they would have been extremely difficult to enforce.

There were no regulations at this time prohibiting the transplanting of fish in state waters. Irresponsible introductions of fish proved detrimental to many of the lakes and streams that were already providing excellent fishing. The Department supported legislation making unauthorized fish plants illegal. It also recommended that the legislature give control of all water use in the state to the Water Conservation Board or the State Engineer. Many streams were dry because their entire flows were needlessly diverted.

The numbers of kokanee in Flathead Lake continued to increase. Thousands of them spawned along the east and west shores of the lake and heavy runs were ascending the Flathead and Swan Rivers. It was estimated that sportsmen took approximately 100 tons of kokanee from Flathead Lake. Through the efforts of the Montana Relief Commission and the cooperation of the Department, a large number of kokanee were seined from the lake and 21,000 cans were packed for distribution to the needy.

Elmer Phillips succeeded K. F. MacDonald as Superintendent of Fisheries in 1934.

Stream improvement was a popular activity nationally at this time as a result of some successful experiments and test programs pioneered by Dr. Clarence Tarzwell in Michigan in 1930. Basically, this consisted of creating pools, riffle areas and cover by the installation of artificial devices, collectively known as barriers, in the stream; thus making the improved area more attractive for trout. The barriers were modeled after those which occurred naturally in good trout streams.

In 1934, through the cooperative efforts of the U.S. Forest Service, Region One, and the U.S. Bureau of Fisheries, Division of Inquiry, a pilot stream improvement program was initiated in Montana. The program was under the supervision of Dr. Tarzwell, representing the U.S. Bureau of Fisheries. The project site selected was the West Fork of Rock Creek in the Deer Lodge National Forest near Philipsburg. Extensive and detailed measurements were made of fish populations, fish food organisms and the physical characteristics, prior to installation of log dams, water deflectors and cover structures in and along the stream. Subsequent duplicate measurements were planned to determine the effects of the various structures, but these were never carried out. Some of the structures are still in place at the present time, not necessarily in the stream channel however, according to Forest Service personnel. The U.S. Bureau of Fisheries also did some stream improvement work at this same time in the Gallatin River drainage. This work was under the supervision of Dave McClay.

Prior to the stream improvement projects, the Bureau carried out a number of surveys on streams situated on federal lands. Dr. Albert S. Hazzard, in a personal communication, reported that he was a member of a field party that conducted stream surveys in Glacier National Park in 1932-33. There was no stream improvement work done in the Park.

1935-36

The 1935-36 Commission under Governor Elmer Holt was composed of Ray G. Lowe, Chairman; W. C. Keil, J. J. Harper, P. G. Gutensohn and A. C. Baumgartner. K. F. MacDonald was named State Game Warden and Elmer Phillips was Superintendent of Fisheries.

The Department was gradually beginning to recover from the many setbacks caused by the economic depression. There was a considerable amount of building at many of the hatcheries, much of which was repair and replacement. Recommendations submitted for new construction included a second dwelling at each of the following hatcheries: Lewistown, Great Falls, Libby, Anaconda and Big Timber. A second dwelling was needed to permit the assistant hatchery foremen to reside at the station where he would be of immediate help in emergency situations. A second man residing at the hatchery would also reduce the incidence of vandalism. Dwellings and ponds were needed at the Salish site, but the need was never fulfilled. A large refrigeration unit was planned at the Anaconda station for storage of the large number of suckers being removed from Georgetown Lake with fyke nets.

The Department tested a number of fish diets within the hatchery system, including the utilization of suckers from Georgetown Lake. The growing shortage of horse livers and other meat products made development of satisfactory alternative diets imperative. The various feeding experiments included a mixture of cooked suckers and carp; a mush made of flour, middlings and liver meal; chick starter meal; and a blend of dried milk, seal meat and salmon carcass meal. None of the experimental diets proved entirely satisfactory for proper fish growth. In all cases, some essential vitamins and nutrients were lacking. It took 20-25 years of testing nationally, to develop a totally satisfactory pelleted fish food.

The Department received a request from the National Park Service in 1935 for rainbow trout to be planted in the Gibbon River in Yellowstone National Park. On

September 1, 1935, a total of 18,000 advanced rainbow trout fry were stocked there by the Big Timber Hatchery.

Over 12 million rainbow trout eggs were taken at the Hebgen Lake traps in the spring of 1935 and almost as many in the spring of 1936. Extremely heavy ice conditions prevented the taking of any brown trout eggs at the Hebgen traps during the fall of 1935. Rogers Lake, in the northwestern part of the state, provided the hatcheries with approximately 12 million grayling eggs each spring of 1935 and 1936.

The first reported airplane distribution of trout in the state occurred in 1935. The event aroused no great interest and elicited no glowing predictions of the use of the airplane in future fish distribution programs. Only minor mention was made in the biennial report which stated simply that Pilot Burt Walker flew 6 five-gallon cans of cutthroat trout fry from the Lewistown Hatchery to the Middle Fork of the Judith River on August 4th and two cans to the same stream on September 1st. The plane was used only to transport the cans of fry and not in the actual planting.

Big Spring Creek near Lewistown has had a history of excess nitrogen in the water, particularly during the period of spring run-off. The Lewistown station reported that on April 5, 1935, two trout caught by fishermen in the stream below the hatchery, had their heads covered with what was termed "air blisters".

C. F. Healea, who initiated operations at the first state fish hatchery at Anaconda when it started production in 1908, was now supervisor of the Maiden Rock Hatchery operated by the Butte Anglers Club. Eggs for the Maiden Rock station were provided by the Department and the Federal Service. The Federal Fish Hatchery at Ennis furnished the Butte Anglers Club 50,000 rainbow trout eggs annually. The Department provided the station with cutthroat trout and grayling eggs. In addition to the eggs given the Maiden Rock facility, the Department furnished about 1¼ million cutthroat trout eggs to private fish hatcheries in the vicinity of

Kalispell and St. Ignatius.

Construction was reported to be progressing well on the huge Fort Peck Dam on the Missouri River near Glasgow. The Department expressed hope that when the dam was completed, operation and flows could return to normal at Hebgen Dam. There was little concern evidenced for the future fisheries in Fort Peck Reservoir itself.

The Polson Hatchery at Station Creek on Flathead Lake was scheduled to remain open for hatching salmon eggs during the winter of 1936. Heretofore, the unit had been operated only during the summer months.

Fisheries Superintendent Phillips reported that the Zoology Department of Montana State College offered a short course in fisheries management in 1936, open to personnel of the State Fisheries Division, the U.S. Forest Service and the U.S. Bureau of Fisheries. Dr. C. J. D. Brown was the instructor. A class of 15 attended the course which was the first such offering in the state. Included in the course were fish biology, the use of the microscope as an aid in identifying fish diseases, basic aspects of water chemistry (dissolved oxygen, carbon dioxide and pH), the identification of aquatic plants and their relationship to fish populations. Superintendent Phillips said that the hatcherymen taking advantage of the course would now be able to go into the field better qualified to determine the suitability of waters for fish life.

1937-38

B. L. Price was Commission Chairman in the 1937-38 biennium under Governor Roy E. Ayers. Other members of the Commission were Harry E. Lay, P. G. Gutensohn, Nick Dondelinger and A. C. Baumgartner. J. A. Weaver replaced K. F. MacDonald as State Game Warden and Elmer Phillips continued as Superintendent of Fisheries. Foremen at the state fish hatcheries in 1937-38 were:

Anaconda - A. G. Stubblefield
Big Timber - Forest Keller
Hamilton - Eli Melton
Emigrant - George Miller
Great Falls - P. G. Botteler
Lewistown - Iver Hoglund
Libby - Graham Cadwell
Polson - Leo Gilroy
Red Lodge - Ross Snyder
Ovando - Vern Campbell
Somers - J. P. Sheehan

With the operation of seasonal fisheries stations and spawning facilities, fish hatchery personnel were usually at one location for only short periods.

PICTURE OF FISH HATCHERIES

P.36&37 1935-36 BIENNIAL

In the spring of 1937, hatchery personnel at the Bozeman station attempted to take golden trout eggs from Hidden Lake, but only a small number was secured.

The waters of Yellowstone National Park were well stocked with both cutthroat and rainbow trout. The Gibbon River received 23,500 rainbow trout in August and 140,000 more in September of 1937. Nez Perce Creek also received 23,500 rainbow trout on the latter date.

Pilot Burt Walker flew 10 five-gallon dans of cutthroat trout into the Middle Fork of the Judith River from the Lewistown Hatchery on August 15, 1937.

The first report of golden trout after 1931-32 was of 6,100 eyed golden trout eggs stocked at the head of the West Fork of Beaver Creek on August 8, 1938. On that same date, the Forest Service received 16,200 one-inch golden trout from the Bozeman station for stocking waters of the Gallatin Forest. The 1938 shipment of golden trout eggs from California to the Bozeman station was apparently a substantial one. That year 12,000 golden trout were planted in Hidden Lake on August 31st;

8,000 in Golden Trout Lake on September 3rd; 10,000 in a lake near Anaconda; 3,000 in Sylvan Lake on September 7th; 2,666 in Sears Lake; 2,666 in Emerald Lake and 2,668 in Lava Lake on October 7th. The latter three lakes are located within the Bitterroot Forest.

1939-42

Governor Ayers Made no changes in the Commission or in Department administration during 1939-40. Melvin Larson was placed in charge of the Great Falls Hatchery in 1939, replacing P. G. Botteler.

The National Park Service began building the Glacier National Park Fish Hatchery at Creston on March 1, 1939. Construction of the unit was completed by late summer of that year and operations began with a shipment of brook trout eggs from Colorado and rainbow trout eggs purchased from a private fish hatchery on Post Creek near St. Ignatius.

At the request of the National Park Service, the Big Timber Hatchery planted rainbow trout in the Gibbon River and Slough Creek in Yellowstone National Park.

Operations proceeded quite routinely during the 1939-40 biennium and little was reported other than the statistics for the period.

Sam C. Ford was Governor of Montana in 1941. Serving on the Fish and Game Commission were J. W. Severy, Chairman; William Carpenter, Elmer Johnson, A. C. Grande and E. G. Vedova. J. S. McFarland was State Game Warden and Elmer Phillips Superintendent of Fisheries. The foremen and assistant foremen at the state fish hatcheries were:

Anaconda - A. G. Stubblefield and Fred Beal
Big Timber - Leo Gilroy and Ross Snyder
Emigrant - George Miller and Fred Billman
Great Falls - Melvin Larson and J. M. Colley
Hamilton- Eli Melton and S. A. Hamann
Lewistown- Iver Hoglund and Leo LaTray
Libby - George Ripley and J. R. Jorgenson
Somers - J. P. Sheehan and Frank Marcoe

Polson - A. E. Tangen and J. P. Campbell
West Yellowstone - Sam Drew

With the entry of the United States into World War II, many Department personnel were serving in the various branches of the armed forces. Some of the expansions planned in the rearing pond and fish hatchery programs were delayed until the war was over.

There was a noticeable change in fish management in 1941 from practices common for the past 40 years. New ideas were investigated and tried. Fish culturists were exploring more efficient methods of operation and there was much greater concern about the quality of fish and fishing.

One of the major accomplishments at this time was the development of the Five-Year Distribution Plan, a project that involved an enormous amount of time and effort for its developers. This Plan was designed to eliminate inefficiencies and inequities and prevent overlaps in the fish stocking program. The Plan was based on the best information from fisheries personnel, wardens, the Forest Service and local residents. Under the Plan, the state was divided into 14 major drainage districts with Yellowstone Park forming the 15th. A detailed map of each district was prepared, along with the fish stocking proposals for the area. The fish distribution schedules took into consideration the optimum production for each fish hatchery. This intensive review of the fish planting program gave the Department a much improved operation. A number of waters considered unsuitable for fish were removed from the stocking program.

Recommendations to bring about greater efficiency in fisheries management included: (1) the establishment of a fisheries research division, (2) improved fish distribution tanks and trucks, (3) installation of large refrigeration units for food storage at the fish hatcheries, (4) expansion of the rearing pond program and (5) fertilization of mountain lakes.

There was a need for qualified fish hatchery employees, but it was difficult to attract such individuals because of the low pay scale. Also, much of the equipment at the fish hatcheries was in poor repair but couldn't be replaced because of wartime restrictions.

Fish losses to irrigation distches and canals continued to be a problem. An investigation by the Department in 1942 showed there were 450 diversions on the Yellowstone River alone, with an estimated 2,000 in the state. Screen had been installed on only 29 major ditches and by 1942, there were only 3 of these still in operation and being maintained. The average cost of a screen was $800 and the annual maintenance about $150. The Department was not financially able to screen all the ditches and diversions in the state and decided the most logical solution was to curtail fish planting in streams which were heavily diverted.

Seining and trapping programs had done little to reduce the numbers of carp and suckers in state waters and the Department was encouraged by reports that a fish toxicant (rotenone) might effectively control rough fish populations. It was expected that this material would be available soon.

Stockwater and irrigation reservoirs were being built at an increasing rate, particularly in the eastern part of the state. Federal assistance in the construction of small dams stimulated participation by landowners. Some of the new reservoirs provided good fishing and the overall potential seemed great. The recently completed Fort Peck Dam on the Missouri River near Glasgow was expected to create a fine sport fishery in both the reservoir and the river below the dam.

The Federal Fish Hatchery at Creston, operated by Superintendent John Pelnar, was holding 2 million cutthroat trout eggs from Yellowstone National Park operations, an unspecified number of brook trout eggs from the Libby Hatchery and eyed Ashley Lake cutthroat trout eggs shipped from the Somers station. All fish reared at the Creston Hatchery were distributed in Glacier National Park.

The number of brown trout eggs taken by the Federal Fish Hatchery at Ennis continued to decline. Hatchery records show the following numbers of brown trout eggs taken from 1933 through 1941:

1933 - 22,010,300	1938 - 376,730
1934 - 28,424,020	1939 - --
1935 - 25,511,635	1940 - 1,370,650
1936 - 14,372,451	1941 - 627,500
1937 - 10,566,415	

1943-46

Department administrative personnel remained unchanged under Governor Ford in 1943, as did the membership of the Commission, with Elmer Johnson as Chairman.

Fisheries Superintendent Elmer Phillips, developed a frame holding pen for fish in 1943. The pen was four feet square and twelve feet deep, covered with metal screening. On June 15, 1943, the pen was suspended in a small lake near Lincoln and 1,000 rainbow trout fry introduced. By October, the fish in the pen averaged three inches in length with the largest up to four inches. No further use of the holding pen system was reported, despite the apparent success of the unit.

After five years of operation by the Park Service, the fish hatchery at Creston was turned over to the Fish and Wildlife Service. Park Service officials announced that henceforth only cutthroat trout would be stocked in the waters of Glacier National Park.

The Department took mature rainbow trout in early February, 1944, from the Madison River traps near West Yellowstone and transferred them to the traps on the South Fork of the Madison River for spawning. About 3 million eggs were taken from these fish by mid-February.

A. G. Stubblefield replaced Elmer Phillips as Superintendent of Fisheries in 1944. Foremen at the state fish hatcheries in 1944 were:

Anaconda - Fred Beal	Lewistown - Leo Gilroy
Arlee - Clarence Ripley	Libby - George Ripley
Big Timber - Forest Keller	Ovando - Virgil Harper
Emigrant - George Miller	Polson - A. E. Tangen
Great Falls - Iver Hoglund	Somers - J. P. Sheehan
Hamilton - Eli Melton	West Yellowstone - Sam Drew

The McNeil Pike Hatchery was built at Nelson Reservoir in 1944 through the cooperation of the Phillips County Wildlife Association and the Department. At the same time, water level control structures were installed on McNeil Slough, an ox-bow of the Milk River, to create a brood pond and fishing area. The project was initiated and developed through the efforts of Warden Herb Friede who was stationed at Malta. He worked long and hard to get materials and equipment for the pike hatchery and then to keep it in operation. When the part-time employees weren't busy at the hatchery, Friede kept them busy seining and [redacted] transplanting bass, bluegills and crappies from well-stocked ponds to new or unplanted ponds in Phillips and the surrounding counties. These operations produced excellent fishing in some ponds for quite a few years. The crappie and bluegill populations became too numerous in some ponds and stunting resulted. Bass reproduction rarely occurred because of the cold water temperatures.

Most of the trout eggs needed for the state fish hatchery system were provided by Department-operated spawning stations. Ashley Lake near Kalispell was a dependable source of cutthroat trout eggs. Brook trout eggs were obtained from Alvord Lake near Troy. Rainbow trout eggs were secured from Bitterroot Lake, Lake Ronan, Madison River, South Fork of the Madison River, Duck Creek and Willow Creek. The Madison River stations also provided large numbers of brown trout eggs.

PICTURE OF SPAWNING IN MADISON RIVER TRAPS

P.27 1941-42 BIENNIAL

In 1945 Governor Ford appointed A. A. O'Claire, recently returned from Army service, to replace J. S. McFarland as State Game Warden.

The crew from the Lewistown Hatchery seined over 20 tons of suckers from Ackley Lake, near Hobson, during the summer of 1945 in an effort to reduce the population. The reduction was only temporary, as the reservoir provided good habitat for the suckers which entered regularly through the inlet canal.

Brush Lake in Sheridan County, received an experimental plant of rainbow trout from the Lewistown Hatchery on June 13, 1945. The plant was unsuccessful, as were several subsequent plants. Recent analyses show that this pot-hole lake has an extremely high concentration of dissolved salts and the water is incapable of retaining sufficient dissolved oxygen to support fish life.

With the return to peacetime economy, the Department reviewed and rescheduled a number of projects which had been postponed. The Arlee Fish Hatchery, which had been leased for several years, was purchased in March, 1945. New construction at this station included a hatchery building, 32 feet by 45 feet, with a large refrigeration unit and 10 concrete tanks, each 32 feet long; two new residences and ponds for brood stock, all at a total cost of $85,000. Sixteen concrete raceways; 104 feet long, 10 feet wide and 3½ feet deep; and two circular concrete ponds, 40 feet in diameter, were completed at the Anaconda Hatchery. The Lewistown station received a new hatchery building, 41 feet by 84 feet, with 18 concrete tanks, 32 feet long, 28 inches wide and 28 inches deep. Four large concrete raceways were also built at Lewistown and a new pipeline laid from the spring to the hatchery. At the Emigrant Hatchery, the old wooden troughs were replaced with 10 concrete tanks. Four new concrete raceways were also built at Emigrant. A natural gas fired heating device was installed at the McNeil Pike Hatchery to raise the water temperature and thus reduce the incubation period of the pike eggs.

The Commission and Department Administration was unchanged in 1947. The Commission did however, approve the establishment of a biology section in the Fisheries Division. C. K. Phenicie was hired to head the new section and reported to the Department July 1, 1947. The fish hatcheries were recognized as the keystone of the Fisheries Division and the biology section would function to complement the hatchery system. Stated objectives of the biology section included assisting the fish hatcheries in developing improved methods of fish distribution and planting, carrying out fish tagging and tag return studies, examination of growth rates and condition of fish and development of a creel census program. Office and laboratory space for the new fishery section were offered by Montana State College at Bozeman. The Department accepted the laboratory facility but decided that the office of the biologist would be maintained in Helena.

Two four-man crews of fishery students were employed in the summer of 1948 to work in the western sector of the state doing stream and lake fisheries surveys - after the plans of Michigan. The productivity of the waters was estimated by evaluation of the surveys and a study of the growth rates. In many of the streams, the crew members had to collect fish specimens for study by use of sport fishing gear, since no other means were available at the time. In response to the many comments about getting paid to go fishing, the crew members welcomed any and all to try their hand at fly fishing on a full-time basis, and then to see if it was still such an attractive job.

Clinton Bishop and Raymond Hayes were sent to Hebgen Lake in the spring of 1948 to gather information on tag returns and to study methods of Utah chub control. No effective method of reducing the number of chubs was found.

The large number of projects that involved some type of construction, prompted the Department to hire C. K. Dalton as Department Engineer. His responsibility was

to prepare plans for the various projects and then to make the necessary inspections to see that the plans were properly completed. One of his first assignments was to visit the west coast states and observe the installation and operation of fish screens. The information obtained accomplished little.

A fish hatchery to be constructed at Bluewater Springs near Bridger and Fromberg was authorized by the Commission in May, 1948. Bids for construction of the unit were opened in July.

Heavy rains, combined with spring run-off, caused the Jocko River to overflow in June of 1948. The Arlee Hatchery grounds were flooded but damage to the facility was kept to a minimum.

The Department received numerous requests or proposals from various groups and individuals, to construct rearing ponds or fish hatcheries on waters in their particular localities. While some of the requests were obvious attempts to help the local economy, most were based on a sincere desire to improve sport fishing. A group of Hill County sportsmen, concerned about the fishing in their area, were convinced that the installation of rearing ponds below Fresno Dam on Milk River, would do much to improve the quantity and quality of trout stocked. Approval for the ponds was granted by the Department and some preliminary work was done at the site. Further investigations made several years later however, showed summer water temperatures in the Milk River to be too warm for rearing trout and the project was dropped.

Small, internal, plastic fish tags were tested on a lot of 255 nine-inch rainbow trout at the Federal Fish Hatchery at Ennis. The tests showed such tags could be used without damage to the fish but, since the tags were inserted into the body cavity, they were easily overlooked and so were not used extensively.

The McNeil Pike Hatchery received 1¼ million walleye eggs from Minnesota in the spring of 1948. The walleye produced were scheduled for northeastern Montana waters. The Anaconda Hatchery received 50,000 silver salmon eggs from the State

of Washington. The Montana spawning facilities produced 3 million brown trout eggs from the Madison River traps and over 2 million grayling eggs from Flint Creek.

Conversions at the state fish hatcheries, the amount of food required to produce a pound of fish, ranged from four to seven pounds in 1948. Modern diet conversions average about 1.5 pounds.

In the fall of 1948, a crew made up of fisheries division personnel and wardens, under the direction of C. K. Phenicie, applied fish toxicant to Savage and Spoon Lakes near Troy. While large numbers of rough fish were killed, the project was not 100 percent effective and enough remained to reinfest the lakes.

Walter M. Allen succeeded A. G. Stubblefield as head of the Fisheries Division in 1948.

The Commission hired Dr. Ira Gabrielson, in December, 1948, to make a thorough examination of Department operations and report his findings and recommendations. His report suggested a number of changes that could be made to improve the Department, but these were largely ignored and the Department continued to operate pretty much as it had in the past.

Elmer Johnson continued as Commission Chairman under Governor John Bonner in 1949-50. New Commission members Tom Morgan and Ed Boyes joined A. C. Grande and William Carpenter. Robert Lambeth replaced A. A. O'Claire as State Game Warden.

Spawning operations at Georgetown Lake in 1949 yielded 2,737,668 rainbow trout eggs; 4,768,314 cutthroat trout eggs; 3,664,386 grayling eggs and 943,721 brook trout eggs. The Willow Creek station produced 4,738,972 rainbow trout eggs; Lake Ronan 270,536 rainbow eggs and Ashley Lake 983,680 cutthroat trout eggs. Approximately 600,000 Dolly Varden trout eggs were taken in the Clark Fork drainage in the Thompson Falls area. The McNeil Pike Hatchery on Nelson Reservoir took over 6 million walleye eggs. The Flathead Lake area continued to provide the hatchery system with about 3½ million kokanee eggs annually. The traps on the South Fork

of the Madison River produced 3,632,656 brown trout eggs.

At the recently purchased Bluewater Fish Hatchery site near Fromberg and Bridger, a residence, storage building and 10 raceways were completed. Vern Campbell was appointed the first foreman.

Since the Federal fish hatcheries were not operating at full capacity because of limited budgets, the Department gave financial aid and assistance to these stations. In 1948 it provided the hatchery at Creston with $5,000 and two men. In 1949 and 1950, $5,000 was given each year.

Ten concrete raceways were constructed at the Arlee station and 5 at Libby. Experiments were still being carried out using cooked carp as a fish food supplement and the results were still poor. Through the cooperation of the Department shop and fisheries personnel, two new fish distribution tanks were built. These units worked exceptionallly well and construction plans were published in the Progressive Fish Culturist. Plants of rainbow trout were made by airplane in the North Fork and South Fork of the Flathead River in July of 1949.

PICTURES OF FISH DISTRIBUTION TRUCKS - OLD AND NEW

P.10 1950-52 BIENNIAL

C. K. Phenicie reported that the new biology section had a number of studies in progress. Information obtained on fish distribution in the state would enable the Department to discontinue planting fish in waters where the stocked species did not appear in the catch. The introduction of incompatible species could be avoided in the future. The quality of fishing and the effects of various fisheries management measures were being investigated. Age and growth determinations and food

analyses were being carried out at the fisheries laboratory at Montana State College. A comprehensive stream study project, headed by Frank Stefanich, was initiated in July of 1949 on Prickley Pear Creek, a tributary of the Missouri River, and continued over a three year period, providing information on fish movements and distribution. The creel statistics and age and growth determinations were made by Clinton Bishop. The age and growth rates of rainbow trout, brown trout, longnose suckers and western white suckers from the Missouri River in the Cascade area, were studied and reported by Joseph Kathrein. The distribution and growth rates of sculpins were investigated by Jack Bailey.

Opening day creel census on Georgetown Lake in 1949 showed silver salmon constituted 50 percent of the catch.

1951-54

The 1951-52 biennium marked 50 years of operation by the Department. Ed Boyes was Chairman of the Commission, which included Tom Morgan and new members Walter Banka, William Sweet and Manson Bailey. The State Game Warden and Fisheries Division administration were unchanged.

No record was found as to when the first drops of fish were made from the Department airplane but they were reported to be increasingly successful. Precise maneuvering by the pilot and special tanks installed in the plane, made it possible to stock fish in remote, inaccessible waters within a matter of a few hours, in contrast to the usual week or more involved with pack animals.

PICTURE OF AIR PLANT

P.5 1966-68 BIENNIAL

PICTURE OF PACK STRING

P.17 1941-42 BIENNIAL

Improvements at the state fish hatcheries included construction of a duplex apartment building at Anaconda, new water supply pipelines at both Arlee and Big Timber, concrete tanks in the hatchery building at Hamilton, additional dirt ponds at Bluewater and installation of a freezer unit at Great Falls.

The Big Timber Hatchery distributed 243,760 kokanee fry into Deadman's Basin, Dailey Lake, Lower Glass Lake and Cooney Reservoir in 1952. Ackley Lake was stocked with kokanee fry reared at the Lewistown Hatchery. Fort Peck Reservoir received 33,600 kokanee and 2,240 lake trout fry from the Somers station. The Anaconda Hatchery received a shipment of silver salmon eggs from the Washington State Fish Commission.

A number of fisheries studies were carried out during the biennium. Dr. C. J. D. Brown and Nels Thoreson completed a comprehensive study of ranch fish ponds in 1951 and published their findings in Montana State College Agriculture Experiment Bulletin No. 480. Over 10,000 copies of this bulletin were distributed free over the next 10 years to ranchers and others interested in pond construction and management. William Clothier investigated fisheries problems associated with irrigation diversions. He found that losses of fish to canals and ditches could be significantly reduced through the removal of attractive pools and bank cover in and along the channels, and by a gradual decrease in canal flows rather than a sharp cut-off of water. Studies of the habits and habitat of grayling in Montana were made by Perry Nelson. The unique and beautiful grayling has been a source of interest to state anglers and researchers for many years. As early as 1874, an article on Montana grayling appeared in the outdoor magazine Forest and Stream. James Blair made note of the grayling population in the Centennial Valley in 1897. Dr. M. J. Elrod of the University of Montana, wrote a brief history of the Montana grayling in 1931 and Dr. C. J. D. Brown of Montana State University conducted a number of research projects and reported on numerous aspects of their life history in the period from 1938 through 1955. A study of scales from known-age fish by William Alvord confirmed

management responsibilities for District 7 were shared by biologists from Glasgow and Billings from 1955 to 1964.

In 1953 William Alvord became District Fishery Biologist in Glasgow for Districts 6 and 7 and Boyd Opheim was assigned to Bozeman for Districts 5 and 3. Arthur Whitney left the Miles City district in 1953 and was assigned to District 2 in Missoula in 1954. Penny Nelson became District Biologist for District 6 in Billings in 1956. Primarily because of low fishing pressure, the fisheries management

the scale method of determining trout age and growth. Most of the trout scales used in this study were obtained from fish tagged in conjunction with fish population and movement studies on Prickley Pear Creek.

Dingell-Johnson funds became available to the state July 1, 1951. These were funds derived from a Federal tax levied on sport fishing equipment. The money was apportioned to the states based on population and license sales. The funds were to be used for fisheries management programs and were obtained by the states on a matching basis of 75 percent Federal and 25 percent state funds.

District Fishery Biologists had now been selected for 3 of the 6 Department districts as follows: District 1, the Flathead area, with headquarters at Kalispell, Frank Stefanich; District 4, north central Montana, with headquarters at Great Falls, Nels Thoreson; District 6, with headquarters at Miles City, Arthur Whitney covered the southeast part of the state. Biologists were soon to be assigned to the remaining districts. District Biologists were responsible for management of the fishery resources in the areas assigned.

MAP OF DISTRICTS

P.39 1950-52 BIENNIAL

The Commission approved the hiring of Jack Bailey as Hatchery Biologist in 1951. His duties included surveillance of the fish hatchery system, helping the hatcheries prevent outbreaks of fish diseases, assistance in coordinating fish distribution and distribution methods and the development of satisfactory fish diets. Bailey spent two months at the University of Washington in 1952 working on the development of a research library. The position of Hatchery Biologist fulfilled a real need and operated for nearly 10 years. Demands on Bailey's time increased steadily, finally reaching the point where it was impossible for him to meet all of

these demands. He resigned in 1961.

On the basis of a recommendation submitted by Biologist William Alvord, preliminary planning for a dam on Beaver Creek in the Bear Paw Mountains near Havre was authorized by the Commission in 1952. The dam would create a controlled and scenic sport fisheries reservoir in an area where sport fishing was limited. Construction of the dam was approved but the bids received for the project exceeded available funds and the project was postponed until 1959.

Looking forward to the long-range benefits derived from an informed public, the Department adopted the Adult Education Program in 1952. It was developed by the Education Committee of the Montana Wildlife Federation - a committee composed of Dr. J. W. Severy, Stuart Brandenborg and Dr. C. J. D. Brown. Two wildlife specialists were later appointed to carry out the program, Eldon Smith from Montana State College at Bozeman and Leslie Pengelly from the University of Montana at Missoula. Lectures on the various aspects of wildlife were presented to groups of interested people throughout the state during the fall and winter. The programs were excellent and generated considerable support for resource management projects.

Under Governor Hugo Aronson in 1953-54, Walter Banka was Chairman of the Commission with members William Sweet, Manson Bailey, H. W. Black and R. D. Shipley. Robert Lambeth returned to warden duty and A. A. O'Claire was again named to fill the position of State Game Warden. Walter Allen continued to head the Fisheries Division with C. K. Phenicie as Chief Biologist.

This Commission adopted an extensive new fish management policy based on both a scientific and an economic approach in 1953. Items included in the new policy were:

1. No fish would be planted closer than ¼ mile from portions of streams closed to public access.

2. Except for experimental plants or reestablishment of a species, only grayling, rainbow or cutthroat trout would be planted in Montana streams.

3. Fish planted in streams would not be less than 6 inches long.

4. Fish should be planted only where spawning was non-existent or inadequate.

5. Fish should be liberated only where a reasonable return to the creel was assured.

6. Fry and fingerling trout would only be used where practical.

7. Fish of all sizes should be liberated at such times and in such manner as to insure the greatest possible return to the creel.

8. Fish should be planted where heavy fishing pressure warranted and where fish populations were being reestablished.

The Department was very much concerned about the destruction of fish habitat through pollution, channel alteration, trampling by livestock and dewatering for irrigation. Balanced planning in resource development and adequate pollution laws were badly needed. Experiments carried out by Marvin Boussu on Trout Creek in the Gallatin Valley in 1954, showed that the removal of brush cover alone reduced the numbers of trout by 58 percent, even though there was a 36 percent increase in the trout population in the undercut area of the stream. Removal of undercut banks reduced the population by one third in the same stream.

In 1954, a study was begun on Pinkham Creek in northwestern Montana. The study was designed to determine the effects of logging on a stream.

The boundaries of the fisheries districts were changed from those reported in the previous biennium and the number was reduced by one. All five districts were now active.

MAP OF DISTRICTS

P.76 1953-54 BIENNIUM

(Names of biologists to be put in the districts -- 1, Frank Stefanich - 2, A. N. Whitney - 3, Boyd Opheim - 4, Nels Thoreson - 5, William Alvord)

The fish hatcheries and hatchery foremen in 1953 were:

Anaconda - Fred Beal
Arlee - Vern Campbell
Big Timber - Forest Keller
Bluewater - Emmett Colley
Emigrant - George Miller
Great Falls - Iver Hoglund
Hamilton - Leo LaTray
Lewistown - Ed Furnish
Libby - Les Newman
McNeil Pike Hatchery - H. Friede
Ovando - Tom Schurr
Polson - A. E. Tangen
Somers - John Cox

Spawning stations were located at Willow Creek Reservoir, Georgetown Lake, Lake Mary Ronan, Little Bitterroot Lake, Rogers Lake, Flathead Lake and the South Fork of the Madison River near Hebgen Reservoir.

Planned future expansion of the Lewistown Hatchery required additional water and the Department purchased Lehman Spring, located a short distance below the hatchery on Big Spring Creek. The spring had an excellent flow of water and an ideal temperature. It was assumed that the water from Lehman Spring would support trout, but eight years later, trout placed in live cages below the spring failed to survive overnight due to the extremely high concentration of nitrogen. This spring water is used at the present time, but only after the excess nitrogen has been removed by two large spray aerators.

The Arlee Hatchery was in the process of developing a rainbow trout brood stock to provide a reliable source of quality eggs for the state hatchery system. Brood fish were selected on the basis of resistance to disease, growth rate, coloration and condition.

Silver salmon eggs were taken from fish that had been held to maturity at the Anaconda Hatchery. This was a first for the state and was considered quite an accomplishment. Success of the operation was not reported; apparently the project didn't prove too desirable since it was not repeated.

The Big Timber station was rearing more rainbow trout, some golden trout and fewer brown trout than formerly. Studies showed that once brown trout became established, further stocking was unnecessary. Except for new introductions, the last plant of brown trout was made in the Little Blackfoot River in 1953.

The Federal Fish Hatchery at Creston received and hatched a large number of rainbow trout eggs from the station at Winthrop, Washington. Fish from these eggs were widely distributed in waters of northwestern Montana.

1955-58

Chairman of the Commission in 1955-56, under Governor Aronson, was R. D. Shipley. Other members were H. W. Black, William Sweet, E. J. Skibby and John Hanson. The administrative staff of the Department was unchanged.

District Headquarters buildings had been constructed at Kalispell, Missoula, Bozeman, Great Falls, Glasgow and Miles City. At Billings, the game farm buildings were being utilized for headquarters.

Construction of Tiber Dam on the Marias River in Liberty County was well under way in 1955. The dam provided an effective barrier to the upstream movement of carp and goldeye. There were approximately 600 miles of river and tributaries above Tiber, inhabited with carp and goldeye. While the removal of fish from such a large drainage with toxicant would be difficult and costly, the opportunity to remove the rough fish and replace them with trout was considered worth the effort. Under the general direction of District Fisheries Biologist Nels Thoreson, the ~~entire~~ part of Fisheries Division and many other Department personnel completed the project. Carp have been found in the waters above Tiber Dam since the operation. These may have been missed in the rehabilitation, or were introduced since that time. No goldeye have been reported in the treated area.

Seeking ways to test the qualities of both hatchery-reared and wild trout under natural conditions, a trout stream was selected where control structures could be installed. This was a one-mile section of Flint Creek below Georgetown Lake. Barrier grates were erected to prevent the movement of fish in or out of the study sec-

tion - one at each end and one in the middle. Enclosures were built over these barriers and heat was provided in the winter to prevent icing. Project leaders were Hatchery Biologist Jack Bailey and John Spindler. Results at Flint Creek include determination of desirable numbers of trout to be stocked in streams and an evaluation of the various fish diets through observation of the effects of transportation of the fish for varying times in different types of distribution trucks. More could have been achieved if the Hatchery Biologist had had sufficient time to effectively manage the experiments and also take care of the hatchery responsibilities required of him.

The Hatchery Biologist reported that the fish hatchery operations in 1955 cost $323,929.88. A total of 15,153,516 fish, weighing 142,830.9 pounds, were liberated. This averaged $2.03 per pound or 4½ cents per fish. In 1956 there were 22,606,786 fish, weighing 131,444.4 pounds, planted. The cost this year was $1.77 per pound or 2 cents per fish. The increased numbers of fish planted in 1955 and 1956 were due to requirements of the Marias River restocking program.

Following closure of the dam in 1953, Canyon Ferry Reservoir was filled for the first time in 1955. Approximately 750,000 fry and fingerling rainbow trout were stocked annually in the reservoir which provided high quality trout fishing.

A number of other management projects were in progress, or were planned, during the biennium, including a study of cutthroat and Dolly Varden trout in the North Fork of the Flathead River; a survey of the Clark Fork River below Thompson Falls in relation to Noxon Dam; rehabilitation of Spencer and Skyles Lakes near Whitefish; a fishery survey of Canyon Ferry Reservoir; rehabilitation of Elk Springs Creek drainage in the Red Rock Refuge and Yellow Water Reservoir near Winnett; repair work on Johnson Dam in Dawson County and survey of the dam and impoundment site on Beaver Creek south of Havre.

Tongue River Reservoir was drawn down in late summer, 1956, so that repairs could be made at the dam. Since the river below the dam was heavily populated with undesirable fish, toxicant was introduced over a several-mile stretch of the river while the reservoir was refilling and flows were very low. Following the rehabilitation, walleye fry from the Miles City National Fish Hatchery were planted in the stream. Tongue River had a history of good sauger fishing prior to the construction of numerous diversion dams. It was hoped that the walleye would become established while the rough fish numbers were reduced.

An experimental rough fish seining operation was carried out on Fort Peck Reservoir for two seasons. Carp, buffalo, and catfish were taken to Chicago, Missouri and West Coast markets and it was found that while buffalo and catfish could be transported and sold profitably, it did not pay to haul the carp to distant markets. The price was low and there were many sources of carp nearby.

The Big Timber Hatchery received a shipment of Kamloops trout eggs from Canada in 1956. These eggs hatched well and 310,464 Kamloops fry were transferred to the Bluewater station for rearing. The fish were held at Bluewater until they reached an average length of 2½ inches, at which time they were moved to the Great Falls Hatchery for subsequent liberation in the newly-filled Tiber Reservoir. No large Kamloops trout have been reported caught in the reservoir since the introduction.

Commission members were the same as in the previous biennium in 1957, with E. J. Skubby as Commission Chairman. In Department administration, C. K. Phenicie resigned his position as Chief Fisheries Biologist in 1957 and George D. Holton was hired to replace him.

The position of Pollution Control Biologist was created in 1957 as a means of combating the growing number of problems associated with water pollution. John Spindler was ~~hired to fill the~~ position and was responsible for handling all pollution violations observed and reported by Department field personnel. Enforcement was carried out by the State Board of Health.

Large numbers of dead fish found along the Yellowstone River in the late fall and early winter of 1955 were thought by some observers to be delayed mortalities related to the July 1955 aerial application of DDT to control spruce budworm infestations. Since no pre-spray information was available, 13 streams were studied in 1956 to obtain data on the effects of DDT spray on fish, fish-food organisms and wildlife. In 1957, follow-up studies were conducted on 7 of the 13 streams. Drift samples and bottom collections showed aquatic insect numbers were materially reduced by DDT spray. While no dead trout were found in the spray area, they were observed below. Tissues of all fish collected (dead or alive) contained DDT.

Plans ~~of the~~ lower unit ~~of~~ the Lewistown Hatchery were approved by the Commission on June 22, 1958. Considerable difficulty had been experienced in producing enough fish for restocking rehabilitated waters and the new unit would have the capacity to provide the fish needed. Construction began in 1958 and was completed in 1959. ~~While~~ It was expected that the lower hatchery unit would receive quite turbid water during the period of spring run-off, Lehman Spring water was piped to the inlet canal ~~provided~~ silt-free water until the stream cleared. However, as mentioned previously, Lehman Spring water was saturated with nitrogen and fish could not survive in it. It was therefore necessary to use the stream water, ~~carrying~~ tons of silt ~~which~~ was deposited in the raceways. This caused injuries to the fish and resulted in heavy losses.

All of the state fish hatcheries were reporting good results from pelleted commercial fish foods. After a rather slow beginning, feed companies were providing a complete and satisfactory fish food at a reasonable price. Fish hatcheries would no longer be faced with the problem of locating sources, storing and processing fresh meats. This made a much more efficient operation and left time to improve the overall hatchery management program. Complete, pelleted, dry diets for fish revolutionized fish hatchery operations.

A committee composed of Joe Halterman from the Missouri River Basin Studies of

the U.S. Bureau of Sport Fisheries and Wildlife, Dr. C. J. D. Brown from Montana State University and George Holton and Harry Nelson from the Department, cooperated in preparing a Stream Classification Map. The map was color coded, showing 436 major fishing streams, or parts of the streams - a total of 8,923 miles in four categories or classifications. These were as follows:

1. Streams of national as well as statewide value (blue)
2. Streams of statewide value (red)
3. Streams of value to large districts of the state (yellow)
4. Streams of value to smaller districts of the state, as counties (grey)

All remaining streams, including those not classified, were placed in Class Five. Class one had only 410 miles of "blue ribbon" stream; Class two 1,072 miles. The figures were considerably less than the "thousands of miles" of top quality trout streams often publicized in Montana. The map had a definitely beneficial effect on water-use planning in the state by all agencies. It provided a measurement that is still being used whenever water development is discussed.

Rehabilitation of the Clearwater Lakes was started in the fall of 1958 with the hope that the large numbers of undesirable fish could be removed and replaced with trout. The entire chain of lakes was too extensive for a single operation, so the project was accomplished in two stages. Rainy Lake was rehabilitated first and a fish barrier constructed at the outlet. The second stage included Lakes Alva and Inez, with a fish barrier built below Lake Inez.

The construction of Branum Lake at Miles City was completed in 1958. This 20-acre, excavated pond was built to provide trout fishing for residents of that area. Water for Branum Lake was pumped from nearby Tongue River, with some water also provided by the adjacent Miles City National Fish Hatchery. Periodic trout stocking maintained good fishing in the pond although undesirable fish were introduced through the water supply system.

Fish population studies on Flint Creek near Philipsburg showed a 94 percent reduction in catchable-size trout when the stream was straightened and meanders eliminated during highway construction.

The Forest Service was concerned about spruce budworm infestations in forests throughout the state and were trying to control the outbreaks through an intensive DDT spraying program. Fisheries management personnel were monitoring the spraying activities closely to determine the effects on fish and fish habitat.

1959-62

H. W. Black was Chairman of the Commission in the 1959-60 biennium and other members were John Hanson, E. J. Skibby, R. D. Shipley and E. G. Leipheimer. W. J. Everin replaced A. A. O'Claire as State Game Warden and W. Alvord succeeded W. M. Allen as Superintendent of Fisheries.

The Department purchased 10 new, stainless steel fish distribution tanks in 1959 and discarded a variety of worn out and inefficient units. The new tanks were 200 and 300-gallon capacity and used bottled oxygen for aeration. The hatcheries also acquired a number of new fish troughs constructed of fiberglass. The troughs were easily cleaned, light in weight and didn't require painting.

Biological investigations showed clearly that the key to good fishing and good fish populations was the maintenance of good fish habitat. The demonstrated damaging effects of stream channel changes on the stream itself, and on fish populations, provided convincing evidence that some type of control was needed. A study carried out on Bluewater Creek near Bridger, showed how fish populations were influenced by return flows from irrigation. Above the irrigation returns, trout and trout food organisms were numerous, while below, the water was warmer and turbid and the stream bed was covered with silt; resulting in very few aquatic insects and a fish population consisting of nearly 100 percent suckers.

The Department acquired a helicopter in 1960 and there were great plans for it in fish management projects. Equipped with pontoons the helicopter could land on high, inaccessible mountain lakes and permit surveys to be made in a matter of hours which would have taken days or weeks using pack animals for transportation. The helicopter also provided an excellent means of transporting and planting fish in the high mountain lakes.

PICTURE OF HELICOPTER

P.21 1962-64 BIENNIAL

Expansion of facilities at the Arlee Hatchery was necessary to handle enough rainbow trout brood stock to furnish eggs for all of the state fish hatcheries. An engineer incorporated ideas of the hatcherymen into a blueprint and the Commission authorized construction. The completed unit incorporated electrically operated crowder gates and a heated spawning house where egg takers could stand beside the inside raceway, pick up the fish from an elevating lift grate, spawn them and send them to the proper outside pond through return pipes. Fisheries personnel from a number of other states visited the unit and utilized some of the plans to improve their own facilities.

PICTURE OF ARLEE BROOD FACILITY

Georgetown Lake contributed much to sport fishing in the state. Many millions of trout and grayling eggs had been taken at the traps on the lake and anglers were

enthusiastic about the quality of fishing the lake continued to furnish. Historically, Georgetown Lake was orig inally a small impoundment on Flint Creek created by a dam built in 1894 by the Bi-Metallic Mining Company of Philipsburg. The site was purchased from Bi-Metallic by the Anaconda Company in 1900 to provide water for winter smelting operations. The Anaconda Company built a power house below the dam in 1901, increased the height of the dam five feet in 1919, another three feet in 1940. Relatively shallow, the lake is very productive, with dense growths of aquatic vegetation occurring in late summer. This situation, coupled with lower than usual water levels, resulted in a heavy winterkill in 1936-37. Populations of desirable fish were almost entirely eliminated while ~~the the~~ suckers and redside shiners survived. Called in to determine the cause of the winterkill, Dr. C. J. D. Brown of Montana State College reported it was due to a lack of dissolved oxygen. Another winterkill, less severe than that in 1937, occurred in 1948. Over the years, fish plants in Georgetown Lake included just about every cold-water species available. ~~Prior to 1948 the trout population in the lake was primarily cutthroat;~~ Since then, large numbers of rainbow have been stocked and are predominant at present.

Fisheries investigations carried out by the hatchery biologist on Flint Creek confirmed studies made elsewhere, that waters have a definite carrying capacity in pounds of fish, regardless of numbers. The introduction of fish into Flint Creek in excess of the normal carrying capacity, resulted in a slower growth rate, a lower survival rate, poor physical condition of the fish and only temporary surpluses.

Because of changes in land use, fisherman access became limited in many areas, with further limitations expected in the future as lake and stream tracts were developed for home sites. The Department initiated an accelerated program of acquiring fishing access sites before land prices made purchase impractical.

A dam was constructed on Beaver Creek in the Bear Paw Mountains, south of Havre, to impound a 40-acre fishing lake. The dam was completed in the fall of 1959 and the

water reached spillway level in April, 1960. Construction of the dam was first recommended by the District Fishery Manager and approved by the Commission in 1952. The new lake contributed to both the fishing and the esthetics of the area. While there are several small streams in the Bear Paws, lakes and ponds are practically non-existent.

With the approval of the U.S. Corps of Engineers at Fort Peck, the Department constructed an earth dike at the eastern end of the dredge-cut area below Fort Peck Dam, isolating a 65-acre pond. The water behind the dike was rehabilitated to remove the undesirable fish and was then planted with trout.

Quite a number of lakes and ponds throughout the state were treated with toxaphene or emulsifiable rotenone to remove populations of undesirable fish. Few, if any, of these rehabilitation projects were ever successful in removing 100 percent of the rough fish; however, the number was usually reduced to the point where the reintroduced trout had a much better chance of survival and sport fishing was improved. One of the larger waters treated was Hebgen Reservoir, following the earthquake in that area in 1959. The opportunity for treating the lake occurred when the reservoir was drawn down for the inspection and repair of the control gates at the dam. The lowered reservoir pool was treated with toxaphene to remove the Utah chub population that infested the waters. Even though the toxaphene was introduced into the various tributaries of Hebgen Reservoir through a series of drip stations, and into the reservoir pool by an airplane equipped with a spray system, the results were negligible. It is believed that the high turbidity of the water at the time interfered with the effectiveness of the toxicant.

The U.S. Forest Service sprayed DDT over portions of the forests on the East and West Forks of the Bitterroot River in 1959 to control spruce budworm infestations. A fisheries study was conducted coincident with the spray program and insect and fish mortalities that occurred during the spraying were closely monitored.

In 1961, under Governor Babcock, E. G. Leipheimer was Commission Chairman with members Lyle H. Tauck, W. E. Staves, E. J. Skibby and John Hanson. State Game Warden W. J. Everin was now called the Director of the Department.

Fish rearing operations were discontinued at the Hamilton Fish Hatchery in 1961. The cold water temperatures at the Hamilton station were not suitable for proper growth of the larger trout needed for stocking waters of the area. The hatchery at Anaconda was well able to produce and distribute all of the fish needed in the Hamilton region. After being utilized for several years as a Game Division field station, the Hamilton site was sold to a private buyer in January, 1967.

A new water line from a nearby spring provided additional water of good quality for the Bluewater Hatchery in 1961. The hatchery at Somers also acquired additional water to supplement the supply from the springs through installation of a pump that brought water from Flathead Lake. A concrete pipeline was constructed from Lehman Spring to the lower hatchery unit at Lewistown.

A modern, efficient fish distribution tank was constructed for the Lewistown station. The unit consisted of a 2,000-gallon, double-walled, aluminum tank that incorporated a number of drainage and aeration features suggested by hatchery personnel.

The alteration of stream channels by man resulted in the destruction of fish habitat and decreased populations of desirable fish. Thirteen trout streams, scattered throughout the state, were surveyed for channel alterations during 1962. Measurements made on the streams showed:

1. One-third of the total length of these 13 streams (250 of 768 miles) was altered from the original state.

2. About three alterations occurred per stream mile, with an average altered length of 664 feet.

3. Alterations produced about a 10 percent decrease in the natural stream channel length.

4. Over 5½ times as many catchable-size trout and nearly 10 times as many whitefish were found in unaltered channels as in the altered channels.

During the biennium, fisheries management biologists surveyed 114 lakes and 67 streams; gathering physical, chemical and biological data useful in future fisheries management recommendations for these waters. In this same period, 24 lakes and 3 streams were rehabilitated with toxicant to remove undesirable fish populations.

The statewide creel census showed the angler's average catch to be four trout and salmon for each day spent fishing.

The Department obtained 15 public fishing access sites, totaling 238.5 acres, in 1961-62.

1963-66

In the 1963-64 biennium, under Governor Babcock, W. E. Staves was Commission Chairman and other members were John Hanson, E. G. Leipheimer, Lyle H. Tauck and Robert Weintz. F. H. Dunkle replaced W. J. Everin as Director of the Department and A. N. Whitney replaced William Alvord as head of the Fisheries Division.

The Stream Preservation Law was passed by the legislature in 1963. The law provided for the protection and preservation of fish and game resources, particularly fishing waters. All agencies of state government were required to give the Department of Fish and Game advance notice of any projects affecting stream channels. The Department then made recommendations for avoiding, or minimizing, damage to fish and game habitat. If the constructing agency and the Department could not agree on the recommended changes, the law provided for arbitration. As written and passed, the law was effective for a period of two years and was then to be reviewed. The legislature did review the law in 1965 and gave it permanent status. While the law was a big step forward, the Department regretted that it did not include private and federal agencies in its provisions.

Dr. C. J. D. Brown and Dr. Richard Graham met with the Commission in January of 1963 to discuss the proposed Cooperative Fisheries Research Unit to be located at Montana State University. The Commission approved financial support of the Unit with the minimum contribution to be $10,000 annually. This money would be used for stipends to students working on fisheries projects. The University provided office and laboratory space plus other services such as secretarial help. The Fish and Wildlife Service paid the salaries of the leader and assistant and furnished operating funds. The Montana State University Unit was established on July 1, 1963 and serves, in effect, as the research section of the Fisheries Division. Its official purpose is to train professional fisheries workers, carry out research on fisheries problems and set up fisheries demonstration projects. Dr. Richard Graham was appointed Unit Leader and William Gould Assistant Leader.

A review of Department properties by the Commission indicated there were several fisheries installations not being utilized. The Polson Fish Hatchery, located on Station Creek on Flathead Lake, was leased to a group of cherry growers in 1963. Two years later the unit was exchanged for a fishing access site on the lake. The stations at Ovando and Emigrant were sold to private buyers in 1964 and 1965 respectively. Areas previously stocked by these stations were included in distribution schedules for the hatcheries at Lewistown, Anaconda, Arlee and Big Timber. The lease on the fish hatchery at Red Lodge was officially surrendered by the Commission in 1964. Fish had not been reared at that station since the late 1940's. The Department had given a supplemental lease to the City of Red Lodge to use the site as a public museum and city park. The buildings at the McNeil Pike Hatchery near Nelson Reservoir, occupied a site leased from the U.S. Bureau of Reclamation. The buildings were sold in 1964. Pike and other warm water fish were supplied to the area by the Miles City National Fish Hatchery.

Richard Johnson was assigned as Fisheries Manager in District 7, with headquarters in Miles City. This was the last district without a fisheries manager.

Previously, the area had been covered from District 6 and some from District 5. Fisheries work in the southeastern part of the state emphasized studies on the Yellowstone and Tongue Rivers, in addition to numerous ranch ponds and small lakes.

E. G. Leipheimer was Chairman of the Commission in 1965-66.

At the Arlee Hatchery, a unique type of box for hatching fish eggs was developed in 1965. Water was brought into the bottom of the box through a flexible hose attached to a fixed, plastic pipe manifold. The hatching box operated efficiently, used less space and water and required less labor than the old system of baskets suspended in hatchery troughs. With various modifications, this hatching box is used by fish culturists throughout the country.

The Bureau of Commercial Fisheries (BCF), later the National Marine Fisheries Service, approved a commercial fisheries research project for Fort Peck Reservoir in 1965. The objective of the project was to obtain information on the abundance, distribution and reproduction of potential commercial fish species such as buffalo, carp, suckers, drum, goldeye, river carpsuckers and channel catfish. The project also involved methods of harvesting the fish. The data collected benefited not only the fishermen on Fort Peck Reservoir, but commercial operators on similar waters in many other states. James Cooper was named project leader. A 35-foot research boat, constructed of heavy gauge aluminum over marine plywood, carrying electronic sounding and temperature sensing equipment was authorized for the project. The boat would provide quarters and a base for reservoir operations. The unit, when completed, proved to be considerably underpowered and operated less satisfactorily than had been anticipated.

PICTURE OF THE FORT PECK RESEARCH BOAT

Investigations had been carried out on Flathead Lake for many years by researchers at Yellow Bay. Most of the studies however, were short-term and only remotely related to fisheries. In 1965 the Department initiated a research program on Flathead Lake designed to secure information on the abundance, growth rates, movements and distribution of fish populations. The project was headed by Delano Hanzel. A former West Coast commercial fishing boat was purchased for use as a research vessel for the project and was fitted with electronic sounding and temperature sensing gear. Various types of sampling nets were also secured. The project, which is continuing, has provided much information on the fish populations, the water chemistry and the physical characteristics of the lake.

PICTURE OF FLATHEAD LAKE RESEARCH BOAT

Use permits issued by the U.S. Forest Service in 1935 for the spawning stations located on Duck Creek, the Madison River and the South Fork of the Madison River were discontinued. The stations had not been used since about 1945. The buildings were hauled away, the traps removed and the sites returned to as near a natural condition as possible. During their operation, these stations provided the Department with many millions of brown trout and rainbow trout eggs. As the stocking of brown trout, other than for reintroductions, was discontinued; and, as rainbow trout brood stock supplied the Department requirements, there was little need to maintain the old spawning stations.

The rehabilitation of Alva and Inez Lakes in the Clearwater River drainage was completed in September, 1965, and the initial restocking with cutthroat trout was accomplished in December. The Clearwater is the only drainage in the state on

which fish barriers have been built specifically to create management units.

The effects of land use practices on a stream flood plain were being studied on Rock Creek in Carbon County in 1966.

At the Anaconda Hatchery, outdated, hazardous wiring was replaced and a new pipeline was constructed to bring water from the spring to the hatchery.

Hatchery personnel at Lewistown constructed several fish distribution tanks and hatchery troughs of fiberglass. The items were built to fit specific needs and work was arranged so as to fit the hatchery schedule. Other state fish hatcheries were working on plans for tanks to be built of fiberglass.

1967-70

Membership of the Commission in the 1967-68 biennium was unchanged from that of the previous biennium. Lyle H. Tauck was Commission Chairman. There were no changes in Department or Fisheries administration.

In eastern Montana, paddlefish snagging developed into a very popular sport. A considerable number of these large fish, some weighing 100 pounds and more, were being caught. The greatest concentration of paddlefish occurred below a low diversion dam on the Yellowstone River at Intake, near Glendive. The dam had existed since 1903 and the only previous report of paddlefish being taken there was during the 1914-16 period. To prevent waste of these fish by some fishermen, the paddlefish was classified as a game fish and the daily and possession limit set at two fish.

About 50,000 pounds of goldeye from Fort Peck Reservoir were marketed in Winnipeg, Manitoba, in 1967 and a contract was arranged for 100,000 pounds in 1968. With the netting techniques used previously, it was impossible to harvest goldeye without also taking quite a few game fish. Research by Department fisheries personnel result-

ed in the development of a method of using floating gill nets, fished away from the shallow areas, that caught almost 100 percent goldeyes. The total commercial catch in 1968 was over 1¼ million pounds of fish, which included bigmouth and smallmouth buffalo, river carpsuckers, channel catfish, freshwater drum, carp, white suckers and goldeye.

Sixteen concrete tanks, 40 feet long, 40 inches high and 40 inches wide, were constructed in the hatchery building at the Anaconda station. The old concrete troughs were removed and discarded. The new tanks increased the efficiency of the hatchery in that newly hatched fry could be held in the warmer water inside the hatchery for a longer period. This achieved better growth before the fish were moved to the colder water of the outside raceways.

A small hatchery building was constructed at the Bluewater Hatchery. Heretofore, eggs had been hatched in hatching boxes set up in the large outside raceways which was an inconvenient operation at best.

There was an almost complete change of Commission members under Governor Forrest Anderson in the 1969-70 biennium. Hugh King was Commission Chairman and the other members were J. J. McCaffery, Pete Clausen, J. J. Klabunde and P. J. McDonough. No Department administrative changes were made.

Anticipating a future need for expanded fish rearing facilities and replacement of some of the older, more unproductive units, the Department investigated flowing spring sites throughout the state. An artesian well with an excellent flow of good quality water, situated near Creston in the northwestern part of the state, was purchased. The site remains to be developed as fisheries needs arise and as funds are available.

The recurring problems associated with silt deposits and injuries to fish in the raceways of the lower unit of the Lewistown Hatchery each spring were eliminated

through construction of a canal and pipeline system in 1970. This system brings water directly from Big Springs to the lower hatchery, picking up the water from Lehman Spring on the way. Baffles installed in the concrete canal and aerators in Lehman Spring effectively remove excess nitrogen. Run-off from the drainage above the hatchery can be entirely by-passed.

Fisheries management personnel were continuing surveys and inventories of state waters, adding to a growing file of information which would be valuable in future fisheries and water resource management recommendations.

Dr. James Liebelt succeeded James Cooper as project leader of the Fort Peck Reservoir Commercial Fisheries Study in 1970.

1971-75

Again in 1971, the Commission membership changed completely. Willis B. Jones was Chairman and other members were Arnold Reider, Jack Cohn, R. J. Emmons and Carl Harbaugh, Sr. Don L. Brown was named to succeed Frank Dunkle as Director of the Department. Changes were made within the Fisheries Division. A. N. Whitney, the Fisheries Division Chief, now became the Fisheries Division Administrator. The designation, Superintendent of Fisheries, was eliminated and the position of Fish Hatchery Specialist, later changed to Superintendent of Hatcheries, created. Robert A. Mitchell was named to fill this position. William Alvord was Chief of the new Bureau of Fisheries Services, initiated to handle Division budgets and assist with Division paper work.

The book "Fishes of Montana" by Dr. C. J. D. Brown was a landmark publication in his long and distinguised career in teaching and research. The Department of Fish and Game and the Montana Agricultural Experiment Station cooperated in the printing of the book which fulfilled a longfelt need in identification and distribution of state fishes.

Libby Dam, constructed by the Corps of Engineers on the Kootenai River, was completed and began storage of water early in 1972. The sport fishery that existed on the river was flooded by the impoundment, Lake Koocanusa. To mitigate the loss of the river fishery and to maintain a desirable sport fishery in the reservoir, the Corps is obligated to provide funds to construct and operate a fish hatchery. Negotiations between the Corps and the Department, relative to the size, location, etc. of the hatchery, are continuing. A number of fisheries and fish habitat studies are being conducted on the new impoundment, its tributaries and the waters in the river below the dam.

Montana's Governor in 1973 was Thomas Judge. Willis Jones continued as Commission Chairman, with members Arnold Reider, J. J. Klabunde, Art Hagenston and W. L. Pengelly. Wesley Woodgerd was appointed Department Director, succeeding Don Brown. There were no changes made in Fisheries Division administration.

Studies made by Region 3 fisheries personnel on the Madison River drainage, indicated that the stocking of catchable trout in a stream with good natural reproduction, resulted in poorer quality fishing than when the stream was not stocked. Based on the Madison study, plants of catchable trout have been substantially reduced in a number of state streams.

The energy crisis has focused a great deal of attention on the rich coal deposits of southeastern Montana. A number of investigations, designed to determine the effects of strip mining and steam power generation on fish populations and fish habitat, were in progress and more were planned.

OBSERVATIONS

The biennial reports submitted by the State Game Warden were, for many years, lengthy, informative and detailed accounts of Department activities and future plans. The Organization at that time was not large, was quite closely knit, and the hopes and frustrations were reported much as they would have been in a personal letter. As the activities have expanded; in number, scope and complexity, many of the projects are written up and submitted as technical reports which, by their very nature, have a limited distribution. The biennial reports have gradually tended to become briefer and more impersonal. Basically, they contain a factual narrative report from the various divisions, the statistics of licenses, numbers of fish planted, the numbers harvested commercially and the overall financial status of the Department.

Over perhaps the past 25 years, sportsmen and sportsmen's organizations have become less and less involved in Department activities. While they still often assist in planting fish, they no longer determine where the fish will be planted or how many will be stocked. Sportsmen no longer operate fish hatcheries, as the Butte Anglers Club once did at Columbia Gardens and Divide. Rearing ponds, which were a popular activity for sportsmen for a number of years, have been found to be generally ineffective in improving sport fishing. Sportsmen's organizations are informed of proposed fishing regulations and their recommendations and opinions are solicited, but they are not a major influence in the final determination. Fisheries management has evolved to where it is based on scientific information and technology not usually available to the average sportsman.

Accepted fisheries management practices changed considerably with the establishment of the biology section in 1948. Before the beginning of the state fish hatchery system in 1908, fish transported to Montana in railroad fish cars from Federal fish hatcheries were stocked wherever the sportsmen wanted to plant them. And even as the state fish culture program developed and the hatchery managers assumed

much of the responsibility for the fish stocking program within their particular districts, they still worked closely with the sportsmen. The fisheries biologists began to accumulate scientific information on state waters and to use this information in the development of fish stocking programs. The fish hatchery managers, less involved in arranging planting programs, have been able to devote more time and effort into the improvement of hatchery facilities and operations. The quality of the fish produced improved steadily. Not everyone accepted automatically, the changes in the Fisheries Division. Fish hatcheries had made up the total Division for 40 years prior to the hiring of the first fisheries biologists. It was understandable that, for a time, there was considerable resentment by many of the hatchery personnel against what was felt to be an intrusion into established fisheries management practices by the biologists, fresh out of college and eager.

As is true for any growing organization, the gradual increase in the number of employees making up the Department and the wider range of Department activities has resulted in a more businesslike and impersonal operation. No longer does every employee in the Department know everyone else, where they are stationed and what they do. The same situation applies to the Commission. For many years they were involved in every detail of Department operation. Individual commissioners regularly visited Department installations and personnel in their districts to discuss day-to-day operations and problems. While Commissioners are still familiar with most Department matters, both statewide and in their respective districts, the growing complexity of operations has made it practically impossible for them to handle the many minor details involved. These have been delegated to the Director's staff.

In recent years there has been a marked increase in public awareness of fish and wildlife habitat and the vital role it plays. Much has been said about our environment and about the ecological imbalances that exist. While this publicity may have served to slow down somewhat the destruction of habitat, losses are still alarming. The Department has been in the forefront of efforts to inform the public

and help prevent needless habitat loss.

The fisheries program in Montana continues to be realistic and progressive and ranks among the best in the Nation. Fact finding and action programs are generally well balanced. It would appear that Montana fishermen can look forward to enjoying a desirable sport fishery for many generations to come.

DATES	SUPT. OF HATCHERIES SUPT. OF FISHERIES CHIEF FISHERIES DIV. FISHERIES DIV. ADMIN.	CHIEF BIOLOGIST	REGIONAL FISHERIES MANAGERS REG.1 - KALISPELL	REG.2 - MISSOULA	REG.3 - BOZEMAN
1908-12	C. F. Healea 11/14/08				
1912-19	H. D. Dean 3/1912				
1919-24	J. H. Brunson 3/12/19				
1924-26	C. A. Jakways 4/29-9/1/25				
1926-28	I. H. Treece - J. W. Schofield				
1928-34	K. F. MacDonald				
1934-36	Elmer Phillips				
1936-40	J. W. Schofield				
1940-44	Elmer Phillips				
1944-48	A. G. Stubblefield	C. K. Phenicie 7/1/47			
1948-50	W. M. Allen	C. K. Phenicie			
1950-52	W. M. Allen	C. K. Phenicie	F. Stefanich 4/16/51		Boyd Opheim 9/2/52
1952-54	W. M. Allen	C. K. Phenicie	F. Stefanich	A. N. Whitney 4/14/54	Boyd Opheim
1954-56	W. M. Allen	C. K. Phenicie	F. Stefanich	A. N. Whitney	Boyd Opheim
1956-58	W. M. Allen	G. D. Holton 1957	F. Stefanich	A. N. Whitney	Boyd Opheim
1958-60	W. M. Allen	G. D. Holton	Boyd Opheim 6/1/59	A. N. Whitney	W. Alvord 6/1/59
1960-62	W. Alvord 6/1/60	G. D. Holton	Boyd Opheim	A. N. Whitney	J. J. Gaffney 7/1/60
1962-64	A. N. Whitney 10/14/63	G. D. Holton	D. Hanzel 3/1/64	Boyd Opheim 3/1/64	J. J. Gaffney
1964-66	A. N. Whitney	G. D. Holton	R. Schumacher 11/15/65	Boyd Opheim	J. J. Gaffney
1966-68	A. N. Whitney	G. D. Holton	R. Schumacher	Boyd Opheim	J. J. Gaffney
1968-70	A. N. Whitney	G. D. Holton	R. Schumacher	Boyd Opheim	J. J. Gaffney
1970-72	A. N. Whitney	G. D. Holton	R. Schumacher	Boyd Opheim	J. J. Gaffney
1972-74	A. N. Whitney	G. D. Holton	R. Schumacher	Boyd Opheim	R. Marcoux 7/1/74

DATES	REGIONAL FISHERIES MANAGERS REG.4 - GREAT FALLS	REG.5 - BILLINGS	REG.6 - GLASGOW	REG.7 - MILES CITY
1950-52	N. A. Thoreson 3/1/51			A. N. Whitney 7/1/51
1952-54	N. A. Thoreson		W. Alvord 1952	A. N. Whitney
1954-56	N. A. Thoreson		W. Alvord	Covered from Reg.6
1956-58	N. A. Thoreson	P. Nelson 5/1/56	W. Alvord	
1958-60	N. A. Thoreson	P. Nelson	C. Hill 7/1/59	
1960-62	N. A. Thoreson	P. Nelson	J. Posewitz 10/1/61	Covered from Reg.5
1962-64	N. A. Thoreson	C. G. Bishop 8/20/62	J. Posewitz	
1964-66	N. A. Thoreson	C. G. Bishop	J. Posewitz	R. Johnson 2/1/64
1966-68	R. Johnson 6/13/66	C. G. Bishop	R. Needham 9/1/66	D. Bianchi 1966
1968-70	R. Johnson	C. G. Bishop	R. Needham	D. Bianchi
1970-72	R. Johnson	C. G. Bishop	R. Needham	A. Elser 2/1/71
1972-74	A. Wipperman 9/16/74	C. G. Bishop	R. Needham	A. Elser

FISH HATCHERIES AND HATCHERY MANAGERS

ANACONDA

1908-12	C. F. Healea
1912-16	H. D. Dean
1923-27	O. E. Johnston
1927-30	K. F. MacDonald
1931-33	Leo Gilroy
1933-44	A. G. Stubblefield
1944-54	Fred Beal
1954-64	A. E. Tangen
1964	R. A. Mitchell

ARLEE

1944-51	Clarence Ripley
1951-70	Vern Campbell
1970	Warren Taylor

BIG TIMBER

1922-23	A. G. Stubblefield
1923-24	M. L. Matzick
1924-31	Iver Hoglund
1931-37	J. W. Schofield
1937-42	Forest Keller
1942-44	Leo Gilroy
1944-57	Forest Keller
1957-69	Ross Snyder
1969	Tom Morgan

BLUEWATER

1949	George Ripley 4/1-9/1
1949-51	Vern Campbell
1951	Emmett Colley

EMIGRANT

1919-

1923-26	J. W. Schofield
1927-30	Oren Hathaway
1931-32	P. G. Botteler
1932-33	O. E. Johnston
1933-35	J. P. Campbell
1935-37	Fred Beal
1937-64	George Miller
1964	Forest Keller

GREAT FALLS

1922-32	A. G. Stubblefield
1932-34	P. G. Botteler
1934-36	Leo Gilroy
1937-39	P. G. Botteler
1940-43	Melvin Larson
1943-45	J. M. Colley
1946-60	Iver Hoglund
1960-61	Eugene McBride
1961	Robert Hughes

HAMILTON

1922-35	J. P. Sheehan
1936-37	Melvin Larson
1940-50	Eli Melton
1951-61	Leo LaTray

LEWISTOWN

1922-23	K. F. MacDonald
1924-25	Iver Hoglund
1926-27	Melvin Larson
1927	Reese
1927-28	J. W. Schofield
1929-31	L. R. Donaldson
1932-33	P. G. Bottèler
1933-44	Iver Hoglund
1944-53	Leo Gilroy
1953	Ed Furnish

LIBBY

1930-35	Elmer Phillips
1935-37	J. P. Sheehan
1937	Elmer Phillips
1937-42	Graham Cadwell
1942-47	George Ripley
1947-51	J. P. Sheehan
1951-61	Les Newman
1961-64	Eugene McBride
1964	R. A. Mitchell
1964	Eugene McBride

McNEIL

1953	Herb Friede
	Tom Schurr
	Jim Eberle
	Clint Burnett

OVANDO

1931-33	T. E. Day
1933-37	Geo. Miller
1937-40	V. Campbell
1941-44	B. Hamann
1944-	V. Harper
1953-54	T. Schurr

PHILIPSBURG

1931-35	G. Cadwell
1935-	M. Walsh

POLSON

1927-32	Eli Melton
1933-35	O. W. Link
1935-37	G. Cadwell
1937-40	Leo Gilroy
1941-54	A. Tangen
1954	Tom Schurr

RED LODGE

1931-32	A. Tangen
1933-34	M. Hoglund
1935-	Ross Snyder

SOMERS

1912-16	H.D. Dean
1913-21	Eli Melton
1921-23	O.Johnston
1923-32	M.Matzick
1932-35	Eli Melton
1935-37	J.Campbell
1937-47	J.Sheehan
1947-51	F.Marcoe
1951-53	E.Furnish
1953-70	John Cox
1970	V.Campbell

BIENNIUM	GOVERNOR	STATE GAME WARDEN DIRECTOR	COMMISSION CHAIRMAN	COMMISSION MEMBERS				
1894-96	- John E. Richards	- R. A. Wagner	- Morton J. Elrod(Missoula)					
1896-98	- Robert W. Smith	- R. A. Wagner	- Morton J. Elrod					
1898-1900	- Robert W. Smith	- R. A. Wagner	- Morton J. Elrod					
1900-02	- Joseph K. Toole	- W. F. Scott	- Morton J. Elrod					
1902-04	- Joseph K. Toole	- W. F. Scott	- E. P. Mathewson(Anaconda)					
1904-06	- Joseph K. Toole	- W. F. Scott	- E. P. Mathewson					
1906-08	- Joseph K. Toole	- W. F. Scott	- E. P. Mathewson					
1908-10	- Edwin Norris	- Henry Avare	- E. P. Mathewson	- G. E. Doll(Helena)				
1910-12	- Edwin Norris	- Henry Avare	- E. P. Mathewson	- G. E. Doll	- M. D. Baldwin(Kalispell)	- W. M. Bickford(Missoula)		
1912-14	- S. V. Stewart	- J. L. DeHart	- E. P. Mathewson	- G. E. Doll	- M. D. Baldwin	- W. M. Bickford		
1914-16	- S. V. Stewart	- J. L. DeHart	- J. L. Kelly(Anaconda)	- M. D. Baldwin(Kalispell)	- Nelson Storey Jr.(Bozeman)	- W. M. Bickford		
1916-18	- S. V. Stewart	- J. L. DeHart	- J. L. Kelly	- M. D. Baldwin	- Nelson Storey Jr.	- W. M. Bickford		
1918-20	- Joseph M. Dixon	- J. L. DeHart	- J. L. Kelly	- M. D. Baldwin	- Nelson Storey Jr.	- T. N. Marlowe(Missoula)		
1920-22	- Joseph M. Dixon	- C. A. Jakways	- T. N. Marlowe(Missoula)	- J. L. Kelly(Anaconda)	- E. A. Wilson(Livingston)	- H. C. Crippen(Billings)	- J. A. Tressler(Malta)	
1922-24	- J. E. Erickson	- C. A. Jakways	- T. N. Marlowe	- J. L. Kelly	- E. A. Wilson	- H. C. Crippen	- E. T. Richards(Kalispell)	
1924-26	- J. E. Erickson	- Robert H. Hill	- T. N. Marlowe	- J. L. Kelly	- E. A. Wilson	- W. K. Moore(Billings)	- E. C. Carruth(Havre)	
1926-28	- J. E. Erickson	- Robert H. Hill	- T. N. Marlowe	- J. L. Kelly	- E. A. Wilson	- W. K. Moore	- G. T. Boyd(Great Falls)	
1928-30	- J. E. Erickson	- Robert H. Hill	- T. N. Marlowe	- J. L. Kelly	- E. A. Wilson	- W. K. Moore	- G. T. Boyd	
1930-32	- J. E. Erickson	- Charles Marrs	- W. P. Sullivan(Sq.Butte)	- B. L. Price(Laurel)	- Wm. Steinbrenner(Missoula)	- W. F. Flynn(Anaconda)	- H. Stanford(Kalispell)	
1932-34	- Frank Cooney	- J. W. Carney	- W. P. Sullivan	- R. G. Lowe(Glendive)	- Wm. Steinbrenner	- W. F. Flynn	- W. C. Keil(Billings)	
1934-36	- Elmer Holt	- K. F. MacDonald	- R. G. Lowe(Glendive)	- P. G. Gutensohn(Whitefish)	- A. C. Baumgartner(Gr.Falls)	- W. C. Keil(Billings)	- J. Harper(Anaconda)	
1936-38	- Roy E. Ayers	- J. A. Weaver	- B. L. Price(Laurel)	- P. G. Gutensohn	- A. C. Baumgartner	- N. Dondelinger(Anaconda)	- Harry Lay(Lewistown)	
1938-40	- Roy E. Ayers	- J. A. Weaver	- B. L. Price	- P. G. Gutensohn	- A. C. Baumgartner	- N. Dondelinger	- Harry Lay	
1940-42	- Sam C. Ford	- J. S. McFarland	- J. W. Severy(Missoula)	- Wm. Carpenter(Butte)	- A. C. Grande(Lennep)	- E. G. Vedova(Roundup)	- Elmer Johnson(Glasgow)	
1942-44	- Sam C. Ford	- J. S. McFarland	- Elmer Johnson(Glasgow)	- Wm. Carpenter	- A. C. Grande	- E. G. Vedova	- J. W. Severy(Missoula)	
1944-46	- Sam C. Ford	- A. A. O'Claire	- Elmer Johnson	- Wm. Carpenter	- A. C. Grande	- E. G. Vedova	- J. W. Severy	
1946-48	- Sam C. Ford	- A. A. O'Claire	- Elmer Johnson	- Wm. Carpenter	- A. C. Grande	- E. G. Vedova	- J. W. Severy	
1948-50	- John Bonner	- R. H. Lambeth	- Elmer Johnson	- Wm. Carpenter	- A. C. Grande	- Tom Morgan(Miles City)	- E. M. Boyes(Libby)	
1950-52	- John Bonner	- R. H. Lambeth	- E. M. Boyes(Libby)	- Wm. T. Sweet(Butte)	- Manson Bailey(Glasgow)	- Tom Morgan	- W. M. Banka(Conrad)	
1952-54	- Hugo Aronson	- A. A. O'Claire	- W. M. Banka(Conrad)	- Wm. T. Sweet	- Manson Bailey	- H. W. Black(Polson)	- R. Shipley(Miles City)	
1954-56	- Hugo Aronson	- A. A. O'Claire	- R. D. Shipley(Miles City)	- Wm. T. Sweet	- H. W. Black(Polson)	- E. J. Skibby(Lewistown)	- John Hanson(Malta)	
1956-58	- Hugo Aronson	- A. A. O'Claire	- E. J. Skibby(Lewistown)	- Wm. T. Sweet	- H. W. Black	- R. D. Shipley(Miles City)	- John Hanson	
1958-60	- Hugo Aronson	- W. J. Everin	- H. W. Black(Polson)	- John Hanson(Malta)	- E. J. Skibby(Lewistown)	- R. D. Shipley	- E. Leipheimer(Butte)	
1960-62	- Tim Babcock	- W. J. Everin	- E. G. Leipheimer(Butte)	- John Hanson	- E. J. Skibby	- Lyle H. Tauck(Hammond)	- W. E. Staves(Polson)	
1962-64	- Tim Babcock	- F. H. Dunkle	- W. E. Staves(Polson)	- John Hanson	- Lyle H. Tauck(Hammond)	- E. G. Leipheimer(Butte)	- Robert Weintz(Gr. Falls)	
1964-66	- Tim Babcock	- F. H. Dunkle	- E. G. Leipheimer	- John Hanson	- Lyle H. Tauck	- W. E. Staves(Polson)	- Robert Weintz 5/	
1966-68	- Tim Babcock	- F. H. Dunkle	- Lyle H. Tauck(Hammond)	- Roy Killenbeck(Scobey)	- W. E. Staves(Polson)	- E. G. Leipheimer(Butte)	- J. J. Klabunde(Havre)	
1968-70	- Forrest Anderson	- F. H. Dunkle	- Hugh King(Missoula) 2/	- J. J. Klabunde(Havre) 3/	- P. J. McDonough(Billings)1/	- J. J. McCaffery(Butte) 4/	- Pete Clausen(Malta) 6/	
1970-72	- Forrest Anderson	- Don L. Brown	- Willis B. Jones(Billings)	- Arnold Reider(Boulder)	- Jack E. Cohn(Helena)	- R. J. Emmons(Gr. Falls)	- C. Harbaugh Sr.(Jordan)	
1972-74	- Thomas Judge	- Wesley Woodgerd	- Willis B. Jones	- Arnold Reider	- J. J. Klabunde(Havre)	- Art Hagenston(Glendive)	- W. L. Pengelly(Missoula)	

1/ P. J. McDonough replaced Robert Wilson (4/11/69 - 10/14/69) who resigned. McDonough resigned 1/30/71.
2/ Hugh King resigned 2/13/71.
3/ J. J. Klabunde resigned 2/13/71. Was reappointed.
4/ J. J. McCaffery resigned 2/13/71.
5/ Robert Weintz resigned 1/31/67.
6/ Pete Clausen resigned 2/13/71.